

A report on Technology adaptation barriers in data-driven business organizations

By

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Id: 16204032

An internship report submitted to the BRAC Business School in partial fulfillment of the
requirements for the degree of
Bachelor of Business Administration

BRAC Business School
BRAC University
May, 2023

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Declaration:

I hereby declare that

1. The submitted internship report is my original work while completing the degree at BRAC University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material accepted or submitted for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

Student's Full Name & Signature:



Sadman Sakib

Id: 16204032

Supervisor's Full Name & Signature:

Dr. Najmul Hasan

Assistant Professor, BRAC Business School,
BRAC University

Letter of Transmittal

12/07/2023

Dr. Najmul Hasan

Assistant Professor,

BRAC Business School,

BRAC University

66 Mohakhali, Dhaka-1212

Subject: An internship report submission on Technology adaptation barriers in data-driven business solutions.

Dear Sir,

It is my pleasure to submit the internship report on Technology adaptation barriers in data-driven business solutions by Sigma Solutions.

In preparing this report, I was guided and directed by my Academic supervisor in every step of making the report. Furthermore, I have learned a lot from this internship and implemented all the learnings I got from my academic courses. However, I have completed the whole internship period of 4 months working at Sigma Solutions, and I have given my best effort in making the report.

Please feel free to reach out if you have any concerns.

Sincerely yours,

Sadman Sakib

ID: 16204032

BRAC Business School,

BRAC University

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Non-Disclosure Agreement

This agreement is made between **Sigma Solutions** and the undersigned student at **BRAC University**.

The student is hereby given the right to use the company's information in making an internship report. However, the student is not allowed to circulate or disseminate any crucial information regarding the company to a 3rd party individual or organization without a prior written request.

Sadman Sakib

Id: 16204032

BRAC Business School,

BRAC University

Acknowledgment

In making this report, I had to get help from some respected persons to whom I am very grateful. I would like to extend my gratitude to Dr. Najmul Hasan, Internship Supervisor, BRAC University, and Mr. Mohammad Atiqul Basher, Internship Co-supervisor, BRAC University, for helping me make and submit the report.

I also would like to thank all individuals and groups who participated in the survey and helped or guided me directly or indirectly in making this report. I thank you all for making it easier on my end.

Executive Summary

This report shows that adapting technology in business processes is crucial to profitably and maintaining sustainability for any business. It is not enough for companies to use a traditional approach for their business processes anymore. Hence, to become efficient in conducting business operations, firms must integrate new technologies. This report also addresses the reasons why SMEs and large organizations are finding it hard to adapt to new technological changes over the years. Furthermore, the report also demonstrates several statistical analyses, charts, and tables proving the research significance as well as what variables are directly and indirectly connected to the issue. However, the report also points out other issues relating to the adaptation of technology in data-driven solutions and how businesses can overcome the barriers leading to great sustainable profitability. Therefore, after going through the report the reader would be able to understand the major barriers to technology adaptation and how they can be overcome.

Chapter 1: Overview of the Internship

Student Information:

Name : Sadman Sakib

Id : 16204032

Program : Bachelor of Business Administration

Major : Management Information Systems

Internship information:

Period : January 2023-May 2023

Company name : Sigma Solutions

Department : Business Development

Address : 5th floor, Abedin Tower, Kamal Ataturk Avenue, Banani
C/A, Dhaka-1213

Supervisor's name : Mohammad Mostafizur Rahman

Position : Chief Executive Officer (CEO)

Job responsibilities:

- Generating business leads
- Creating and maintaining a good business relationship with all the stakeholders
- Managing sales database
- Developing new sales strategies for further revenue generation
- Working with the technology team to address and resolve software and hardware-related issues at clients.
- Visiting businesses with commercial proposals.
- Communicating business products and different modules of CRM systems.
- Integrating further modifications to the software according to the client's requirements.
- Continuously maintaining contact with the company that provides us with the servers.
- Resolving server issues faced by our clients.
- Improving the department's workflow through diligent analysis.

Last, but not least, my responsibilities were not limited to the above-stated points, also performed other tasks allocated by my internship supervisor.

Internship Outcomes:

The internship had a lot of outcomes starting from my contribution to the company, learning, Issues or difficulties faced during the internship period, and my recommendations for the future internship program. In the later parts, I will discuss the outcomes and the recommendations for the organization.

Student's contribution to the organization:

In this internship, I have contributed a lot to the organization. As my job responsibilities addressed earlier, I have worked in the fields to visit other business organizations and make business deals with them offering the best software services and generating revenues for the organization. However, every individual working in business development was given a target to reach every day. For example, I had to visit more than 6-7 organizations daily communicate our products and services and how would the software help our customers generate further revenue. I also helped my teammates reach their targets as well. Furthermore, I was also responsible for maintaining the lead generation and sales data. Therefore, I had to input all the data manually regularly to draw out necessary conclusions regarding which businesses to visit in a week, and how the business proposals should be made to avoid a zero-sum game. However, I was also instructed to be innovative and improvise when a difficult situation arises. So, I had to make a lot of improvisations that helped the organization in a great manner. For example, one of our clients was facing severe issues with the servers as well as their software, due to the absence of members of the tech team. In this situation, I have been able to resolve the issues on the spot with the help of our tech team online. Finally, I would like to mention that my contributions to the company were not limited to the points indicated above rather I performed tasks based on need-to-do while conducting business.

Student's benefits:

As an intern, I have learned a lot from the company. Especially since this is my first job where I worked directly in the fields hunting for business leads and figuring out ways to generate further revenue for the organization. The core benefits of the internship are discussed below with multiple key points;

- **Leadership:** While working as an intern at Sigma Solutions, I carefully observed the ways our CEO used to lead us throughout the transition starting from searching for leads to generating revenue or selling multiple software modules for businesses.
- **Marketing:** As a Business Development Executive, I had to focus more on learning about marketing through working in the fields. To be specific, I learned several marketing approaches that go with the current market situation based on the targeted customers of the software. Working closely with business clients as well as visiting and analyzing markets have taught me a lot.
- **The industry itself:** Since, as an intern, I had to conduct market analysis and consumer behavior analysis, I learned a lot about the software development industry. To be precise, the sort of business automation organizations need at an affordable cost, the scope our country has for business automation and data-driven solutions, the industry sustainability, potential growth, industry attractiveness, and so on.
- **Skillsets:** I learned a lot of necessary soft skills as well as hard skills. To elaborate further, soft skills include effective communication, critical thinking, persuasion, professional etiquette, decision-making, inductive and deductive reasoning, and so on. Furthermore, the hard skills that I got to learn are database management, data visualization, creating reports, business and financial proposals, marketing approaches, campaign planning, budgeting, and so on.

There is a lot that I have learned from the internship which will help me groom my professional life towards a successful career.

Difficulties/Problems:

During my internship period, I faced a lot of difficulties conducting business. They are briefly explained below;

- **Communication:** At the very beginning of my job, I struggled a lot to communicate with our customers. As a matter of fact, I struggled to speak for the first few days. However, when my supervisor taught me what exactly I have to say to persuade consumers to buy our software. After some training, I was able to communicate our products and services to our customers.
- **Managing customers:** As an intern, managing customers was one of the important responsibilities among others. However, I faced a lot of difficulties managing consumers as most of them were not willing to purchase our software and I had to repeatedly contact them to know how our products can deliver efficiency with sustainable profitability. Moreover, some of the consumers were very hard to reach so we used to conduct meetings online to get the business done.
- **Closing the deal:** I faced a lot of difficulties closing the deal because most of our clients gave us positive feedback and understood the importance of data-driven business solutions but later they did not agree to the deals because they did not have enough resources to integrate the module/s to their systems. Moreover, some of the owners gave us excuses to avoid our team because they reckon, they do not feel the need to integrate technology into their business shifting from the traditional approaches.

Recommendations:

After going through the internship period, I believe, I have some recommendations for the future internship program. They are briefly described below;

Arranging training sessions: Taking part in training after interns join companies is the most crucial part. Before interns set out to do their jobs, they should have professional training. For example, I have faced a lot of difficulties getting a grasp of everything, but early training helped me get the job done using the least number of resources.

Adapting different marketing strategies: Clinging to the same marketing strategy for years would not be efficient when it comes to selling software. The industry itself is not new, however, if we think from the perspective of our country, the business owners of SMEs are not quite aware of the functionalities of ERP and CRM systems. Therefore, I would recommend the organization adopt different marketing approaches before taking interns and setting them out to do their job in the business development department.

These are the recommendations I would like to suggest to the organization.

Chapter 2: Organization Part

Introduction:

Every firm conducts its business differently. However, as an intern, I had to ask and get an idea about how the departments run and what approaches they follow while conducting business. Therefore, in this chapter, I will discuss the organization as well as how it functions and what sort of practices the firm follows to conduct its business.

Company Overview:

Sigma Solutions is a software development firm founded in 2018. The firm develops data-driven solutions for business organizations. Furthermore, the products of the firm are modules of CRM systems. Some of the modules the firm is offering is for managing customers while others are responsible for efficiently managing businesses online.

The organization has great teams in what they do. With all the hard work, they are introducing a new set of cutting-edge technologies using Machine learning, Deep Learning, and Artificial Intelligence adding value to the business organizations. Moreover, the firm also helps organizations make decisions through descriptive as well as predictive analysis. The company has been serving national and international clients in several industries. For example, the Telecommunication industry. Sigma has been in business with ROBI as well as Airtel for years as a project-by-project renewable contract.

The mission, vision, and the products and services are briefly explained below:

Mission: To bring excellence, and ingenuity to businesses of all sizes by adding value to the products and services through smart and innovative use of information technology.

Vision: To continue to establish a reputation as one of the most cutting-edge providers of IT solutions and services through the implementation of AI and ML.

The organizations offer different sorts of products and services to their clients. They are briefly described below;

Services offered:

The services offered to business organizations include services like the following;

- Data Analysis
- AI & ML-based customized software
- Application maintenance support
- Web Solutions
- Networking Solutions
- Graphical and Multimedia Solutions
- Project and Process management.

These are the services that are offered by Sigma Solutions to their clients.

Products offered:

The products of the organization add a lot of value to the client's businesses. Moreover, the products are developed using advanced AI and ML algorithms. They are given below:

- **SMARTCOMM:** This software is developed for managing call centers within the organization. Special features include scheduled SMS, email, and calls as well as customized calls, and clients' data-driven insights.
- **PIXMAMA:** It is a digital platform where artists can register themselves and source or supply images. Special features include shared customized content, shared revenue of 65%, and online transactions using credit cards.
- **WECARE:** It is a value-added service of the healthcare industry. This software reminds patients what medicines to take and when to them and ensures that the patients are taken

care of. Special features include Scheduled calls with a recorded voice, Scheduled SMS, instant calls, SMS, and Email.

These are the products and services of Sigma Solutions. However, some new products are being developed at this moment.

Management practices:

The organization follows traditional approaches to manage the operations of the Human Resource Department. To elaborate further, as it is a very small organization, the firm does not have many members on its team. Therefore, the upper authority does not feel the need to adapt to the latest technological changes or approaches to handle operations in the department. However, the firm follows a certain type of leadership style, which is briefly explained below;



Autocratic leadership: The firm follows autocratic leadership to make large decisions and decisions related to finances. All the major decisions of the firm are taken by the CEO himself. Moreover, he is the one who founded the organization managing tech teams to develop all the

solutions. For example, the CEO distributes the work and the projects among departments setting a KPI for each individual to attain.

Participative leadership: On the flip side, if members of the department encounter an uncalled problem relating to making sales or closing the deal, in the sort of situation, teams are authorized to make decisions themselves to resolve the issue if the CEO is not reachable.

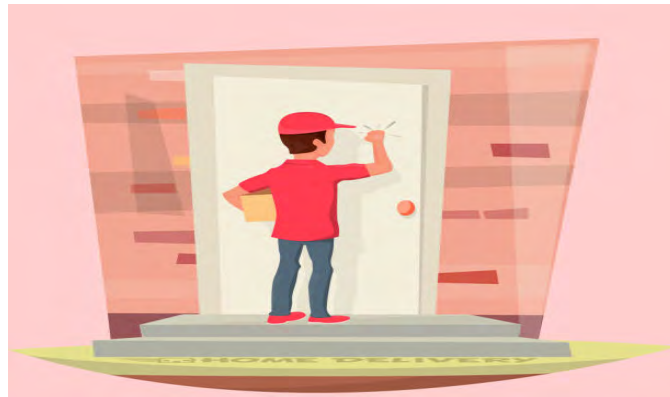
Recruitment process: The firm follows the traditional approach to recruiting employees in departments. To elaborate further, the CEO himself takes interviews to recruit employees. However, the candidates who apply for different positions at Sigma Solutions also are examined by the team members to figure out the best fit.

Marketing Practices:

As the firm is still a startup and they are mostly working for major clients on a project-to-project basis from the very beginning, the CEO thinks that they do not need to adopt different marketing approaches rather than just the traditional ones. In the later parts, I will discuss the firm's marketing strategy, target customers, marketing channels, and critical marketing issues and gaps.



Marketing strategy: The firm solely focuses on the traditional approach. To elaborate further, the firm follows door-to-door marketing. We as a team in the business development department were used to reach business organizations physically to market our products and services with proposals and other tech support if asked.



Target customers: Since we offer software and other IT services, our targeted customers are businesses of all sizes starting from conglomerates to SMEs. However, in large organizations such as ROBI and Airtel the products and services are offered according to their customizations whereas customers owning small enterprises are offered the products and services that are not customized and also go with their business needs.

Marketing channels: As the firm is a startup, it does not focus on different channels of marketing such as free marketing, paid marketing, or digital channels rather it only focuses on the traditional marketing channel. Furthermore, among other approaches in the traditional marketing channel, the organization only follows outdoor, print and direct mail to ensure high brand awareness and to make sales.

Critical marketing issues and gaps: In my opinion, the firm has a lot of marketing issues and gaps which result in less profit making questioning its sustainability. The firm follows only the

traditional approach which is door-to-door marketing. However, I would like to mention that the biggest marketing gap in the department would be not having marketing experts or experienced individuals to train and set attainable goals and targets to eliminate gaps and lead toward sustainable profitability.



Moreover, I also would like to address the gap in not adopting other marketing strategies as well as marketing through different other marketing channels. I believe, that to achieve sustainable profitability the firm should welcome new marketing strategies employing experts in the field. Additionally, the firm must use other marketing channels to create brand awareness as well as to communicate the products and services to the targeted customers.

Financial performance and accounting practices:

The financial performance of Sigma Solutions is briefly described below;

The Financial Performance: The organization is performing very well because it has multiple continuing projects with ROBI, Airtel, and so on. These are the clients for whom the company existed for the first time. If I talk about practices, the whole finance is handled by the CEO himself

and he has one employee working under him to help with matters regarding finance. However, the firm does not use any sort of system to run its financial operations.

Liquidity: The firm does not generate liquid assets on a daily or monthly basis. After the projects started, the money comes through every quarter bringing the firm a lot of money to operate.

Profitability: With all the projects with major companies, the firm sure gets the taste of profitability. After successfully obtaining the payment, the firm reinvests a certain amount from the total profitability,

Accounting practices: To talk about accounting practices, the firm has only one individual working in finance and accounting. However, the firm does its accounting practices just like the other firms out there. So, firstly, they come up with an income statement to measure the profitability. After that, they start preparing the final balance sheet at the end of the fiscal year. Therefore, these are the accounting practices that the company follows to maintain its books.

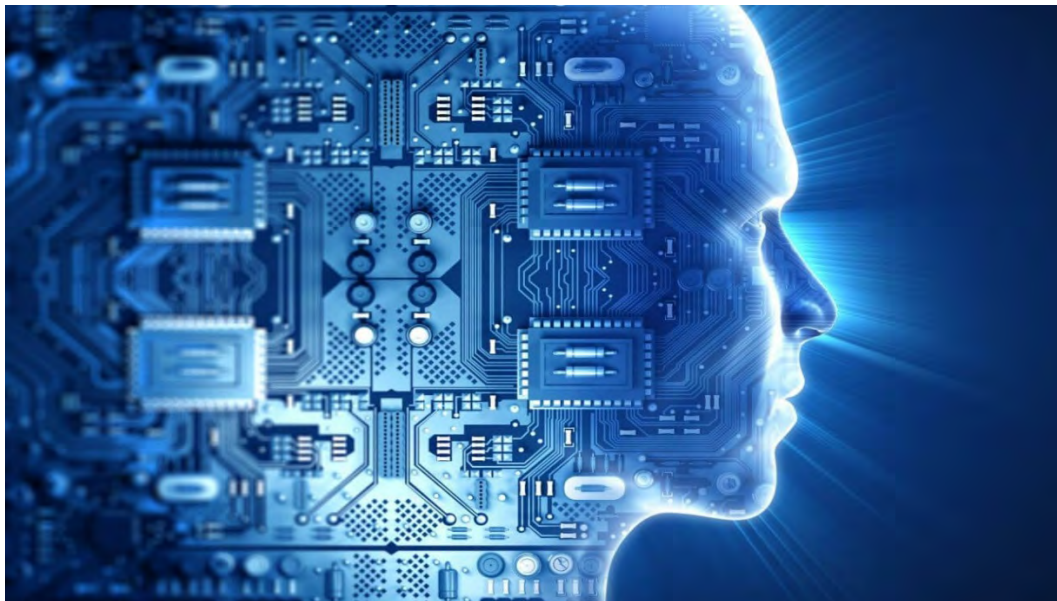
Operations management and information system practices:

As the firm only works on a project-to-project basis. All the members are recruited on a need-to basis. For example, a software development project requires 5-6 individuals who are going to work on different parts some are responsible for working in the front end while others are responsible for working in the back end of the software. However, the operations of the company are managed by the CEO himself. He ensures quality management by overseeing a bunch of activities to

maintain quality management, including the creation and implementation of quality planning as well as quality control and improvement.

Information systems practices:

The firm follows different sorts of information system practices to manage its information as well as make good decisions and draw out necessary insights based on different sorts of data. The practices are briefly discussed below:



Storing records: After the end of workdays, we were required to fill in the data in our sales repository. The record includes information like company name, owners' information, interested products, address, and so on. However, the metrics are only used for individual organizations that we reach to sell our products and services.

Using tools for visualization: As an information system practice, the firm also has employees who work on data visualizations and predictions. Members of the tech team are responsible for the sorts of work. They used to work with data that we stored and visualize with informatics to make important decisions, and address trends as well as the areas of improvement for departments.

Moreover, with the data, they can also predict the sales every month and allocate resources based on that.

Industry and competitive analysis:

In this part, I will perform a couple of analyses to define the industry competitiveness as well as the strengths and weaknesses of the firm.

Porter's Five Forces analysis:

This analysis would determine the industry's attractiveness as well as identify competitors in the same industry. It includes forces like the threat of new entrants, the threat of substitute products, rivalry among competitors, the bargaining power of buyers, and the bargaining power of suppliers.



- **The threat of new entrants:** As IT and software development companies are on the rise due to the development in the sector, I believe, the threat of new entrants would be high. Moreover, creating an IT organization takes a lot less than competing in other industries as an IT firm does not have any tangible products to move and store, rather a firm with IT services or software development can serve its customers with their offered services online.
- **The threat of substitute products:** The threat of substitute products would be low because there are no substitute products for business process automation as well as data-driven business solutions. The software that we offer to individual business organizations are modules of a CRM system. Therefore, without integrating any system or software, it would be very hard for companies to manage a lot of data and effectively use the data in different departments. Hence, the threat of substitute products is quite low.
- **Rivalry among competitors:** The rivalry among competition would be very high in this industry. Since the industry is developing with technological advancements and revolutions, and the threats of new entrants are comparatively higher than before, I believe, the competition among rivalries is very high. Moreover, many firms are competing in the industry with a massive number of resources at their disposal. Therefore, the rivalry among competitors would be very high.
- **Bargaining power of buyers:** The bargaining power of the buyers would be very high because there are a lot of organizations out there in the market that offer the same products and services as we do. As a result, the buyers would have more bargaining power over the organization. However, if there are not many organizations offering the same products and services then the bargaining power of the buyers would be low.

- **Bargaining power of suppliers:** The bargaining power of the suppliers would be low. Because there are a lot of suppliers in the industry who are willing to do business with us at a cheaper price. To elaborate further, our suppliers are the ones who provide us with the servers and other stuff such as a valid official contact number and so on. So, there are a lot of organizations offering the same services decreasing the bargaining power of suppliers in the industry.

After analyzing the industry, I believe, it is a bit hard to do business in the industry with the least number of resources. However, if an organization has a good number of resources, it will be a bit easier for the firm to sustain and do business competing with other firms in the industry.

SWOT analysis:

This is the sort of analysis that we perform to define a firm's strengths, weaknesses, opportunities, and threats. In the following part, I will briefly discuss the different dynamics of SWOT about Sigma Solutions.



Strengths: The strengths of the company are briefly explained below;

- **Financial resource:** It is one of the biggest strengths of the firm. The firm has ongoing projects with ROBI and Airtel which generates a lot of revenue for the organization.
- **Fewer employees:** The firm has a few numbers of employees working in different departments. I believe it is a strength because the fixed cost is decreased for having fewer employees who love to work remotely.
- **Patent:** It is one of the important resources of the firm. The software that the firm developed and marketed, has a utility patent legally protecting the algorithm so that no one can duplicate and sell them in the market.
- **Huge customer base:** Since it is an IT firm providing businesses with data-driven business solutions and other services to automate the business process of customers, the customer base for these services is huge. Every other business needs a data-driven solution to run the organization efficiently. Therefore, it is a strength of Sigma Solutions.

Weaknesses: The weaknesses of Sigma Solution are briefly explained below:

- **Debt:** This is one of the most common weaknesses of the organization. The firm has a lot of debt that it has been repaying for years. The debt is a long-term debt that will be carried on for years.
- **Unexperienced team leaders:** Despite having multiple departments, the firm has several employees operating the departments who are not experienced in this industry. Therefore, I believe, this is one of the major weaknesses at Sigma Solutions.

Opportunities: The opportunities that the firm has, are given below;

- **Innovative products:** As the market is still building, there are a lot of opportunities for making innovative products such as different modules of ERP systems for different departments in small organizations. It would make the company a lot of revenue.
- **Reduction of operating cost:** Every IT firm needs individuals for their tech team. By letting employees work remotely, there would be a massive reduction in fixed operating costs. So, this is one of the biggest opportunities for the firm.

Threats: The threats that are faced by the organization are briefly explained below;

- **Viruses:** This is one of the common threats for IT firms. If there are viruses injected into the system, the firm might end up losing large amounts of data such as sales and financial data stored by other business organizations.
- **DDoS attack:** A distributed denial of service attack is the sort of attack that comes from multiple compromised devices targeting a server or a website making it unresponsive. To prevent this sort of attack security measures such as patching firewalls, setting protocols for a potential attack, and so on.

If the firm sets up its physical server, then I believe it will be very hard for attackers to infiltrate the system.

Recommendations:

After all the discussion about the practices Sigma Solutions follows, I have some recommendations for the organization;

- **Creating a secured network infrastructure:** To get rid of all of the cyber-attacks, the firm must invest in creating a secured network infrastructure in which they have their

firewalls to protect the system as well as their data. Moreover, the firm must focus on having its own physical server stored in a protected place to get rid of all malicious viruses.

- **Financial management:** In my opinion, the firm must employ more executives or experienced individuals who can help manage the firm's money most efficiently. Such as tracking the cash inflows and outflows to the organization, budgeting, distributing resources based on priority, keeping track of sales and revenue, doing all sorts of data analysis to predict and develop company financials, and so on.
- **Marketing through different channels:** Well, working in business development was really challenging at some point because customers do not understand the need for software in business process automation to increase their revenue stream as well as manage the business efficiently. In order to be profitable in the industry, I believe, the firm should reach businesses through different channels and educate the business owners about the usage of software and how it can benefit them in the long run. Marketing on the Internet should be enough to solve the issue for now by marketing through different channels such as social media, print media, television, mobile, and through other sources as well.

These are all the actions that I recommend to the organization for better profitability and stability.

Chapter 3: Project Part

Introduction:

Technological advancement has always been an inevitable circumstance, where no matter how updated the systems are they still can be developed further through different levels of automation.

In this 21st century, everything can be achieved through technology. Among the technological

advances we have, data and systems are the automation that has been utilized by all or some businesses in all industries. Especially, the major players of every industry have been using data and software to efficiently manage their resources as well as business. However, in the 1st world countries, it is a must for business organizations to have system integrations to generate, manage, and harness data to smooth business operations advancing to the highest players. On the other hand, if I talk about the scenario of Bangladesh, major corporations and top players of all industries use data and software to run their businesses. However, most SMEs operate without using data and software and face different sorts of operational errors as well as other issues. Therefore, in this paper, I will try my best to discuss and statistically prove the barriers that are faced by SME owners in integrating data-driven business solutions as well as software to operate businesses and how the issue can be resolved towards making businesses sustainably profitable.

Literature review:

Adaptation barriers refer to the problems or issues faced by SME owners accommodating data-driven business solutions into their businesses. In this era, organizations can keep up with technological advancement by implementing and integrating systems and software into their business to automate processes as well as compete globally, ensuring a certain market share in the industry. However, these organizations become major players by using data and software to manage businesses as well as continuously improving the system looking for efficiency while conducting business. So, to accommodate data-driven solutions for businesses, business owners face a lot of barriers. Studies addressed several issues regarding adopting technology in businesses. Among other issues that the existing literature indicates, the lack of government support is one of them (Doh and Kim, 2014). Governments are the ones that should support SMEs with financial

resources. Because SMEs do not usually have enough resources, to begin with. Therefore, clearing out the barriers to adopting technology requires a certain number of financial resources that should be provided as a loan with further interest to invest in technology to manage a business efficiently. On the other hand, if lending money causes a problem as there are a lot of SMEs out there in our country, the government should support the business owners and employees by providing further training and educating them about technologies, and their usage to adopt data-driven business solutions. For process automation as well as for better operations and resource management. A study also addresses the major problem in accommodating technological innovation at firms due to SME owners and employees not having sufficient knowledge about data, software, and systems to smooth the business operations as well as other resource management ([Kaminski et al., 2008](#); [Caloghirou et al., 2017](#)). Other studies also indicate that major challenges in technological innovation in firms are lack of resources and noninnovative employees who do not bring many ideas to the table ([Olander et al., 2014](#)).

However, in the later parts, I would perform some statistical analysis based on the data collected to achieve all the broad and specific objectives.

Project objectives:

Objectives of a project refer to the specific reasons research is conducted. My objectives for this project are given below;

Broad objective:

To examine what barriers SME businesses, face to integrating data-driven business solutions into organizations to smooth operations.

Specific objectives:

the specific objectives for the project are given below;

- To assess the current scenario of SMEs with little or no technological advancement.
- To assess the major resources of SMEs, and how effectively they have been used to efficiently run business operations.
- Disseminating knowledge about data-driven technology integration to SMEs as well as large organizations.

Significance:

The significance of a study indicates how the study contributes to the same field. To elaborate further, the significance of the study that I am working on is vast. Bangladeshi organizations have been facing many issues with their operations following the traditional approach of using paper-driven bookkeeping, resource allocation, and operations management. Most organizations use the traditional approach of operating businesses resulting in inefficiency as well as loss of resources leaving the organization no choice but to keep doing business in the old ways. However, after this study is conducted, the owners of SMEs as well as investors in different industries would be able to understand how important it is to integrate technology into the businesses to smooth the operations. Moreover, integrating technology into businesses also helps business processes to be automated and driven by data so that with that data all sorts of analysis can be performed such as diagnostic, descriptive, predictive, and prescriptive analysis to make major decisions that contribute to the books of the businesses indicating an increased revenue stream. Finally, we can say that the project is going to contribute a lot to the existing studies indicating the major barriers that are faced by the owners of organizations who do not feel like accommodating technology into their businesses. Moreover, the project also signals the beneficiaries of the study from the findings

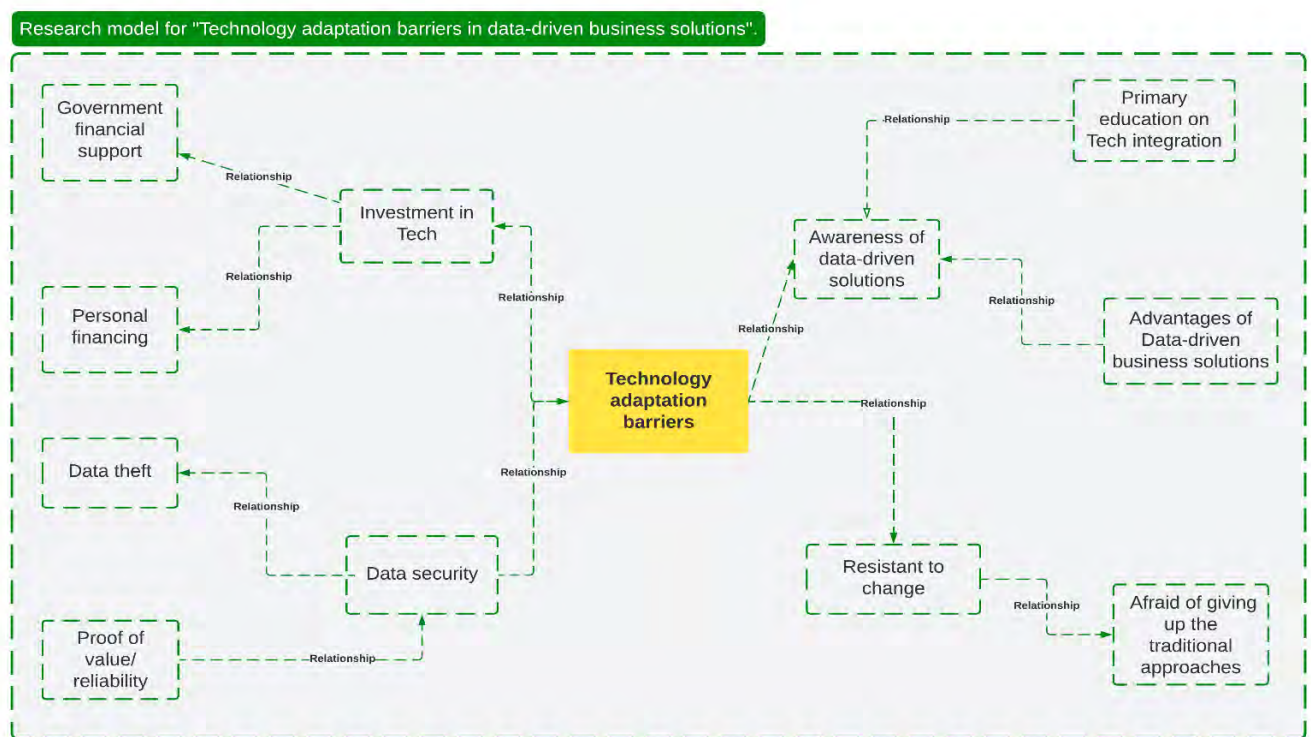
and analysis, disseminating knowledge to a large number of readers about data-driven business solutions to automate business processes.

Methodology:

A research methodology tells the readers what sort of research this is, what sort of data collection method has been used to conduct this research, what the data looks like, whether it is qualitative or quantitative, and so on. The methodologies and data analysis processes are briefly explained below;

Research model:

The research model addresses all the variables that are directly and/or indirectly related to the main topic i.e., the technological adaptation barrier in data-driven business solutions.



The research model addresses the major variables that are interlinked or directly/indirectly related to the main research problem, i.e., “Technology adaptation barriers in data-driven business solutions”. The major issues causing the adaptation barriers are pointed out in the list below;

- Investment in technology
- Data security concerns
- Awareness of data-driven business solutions
- Resistant to change.

Research type:

The research would be mixed methodology research. The type of data that is collected for the project is basically answers in words, which could be either written or spoken. Furthermore, there would be quantitative data collection as well since the project is mixed-method research. However, in conducting the research, I believe, the mixed method research would bring out the best of both of the methodologies leaving us with a clear picture of the problem as well as the solutions.

Sampling strategy:

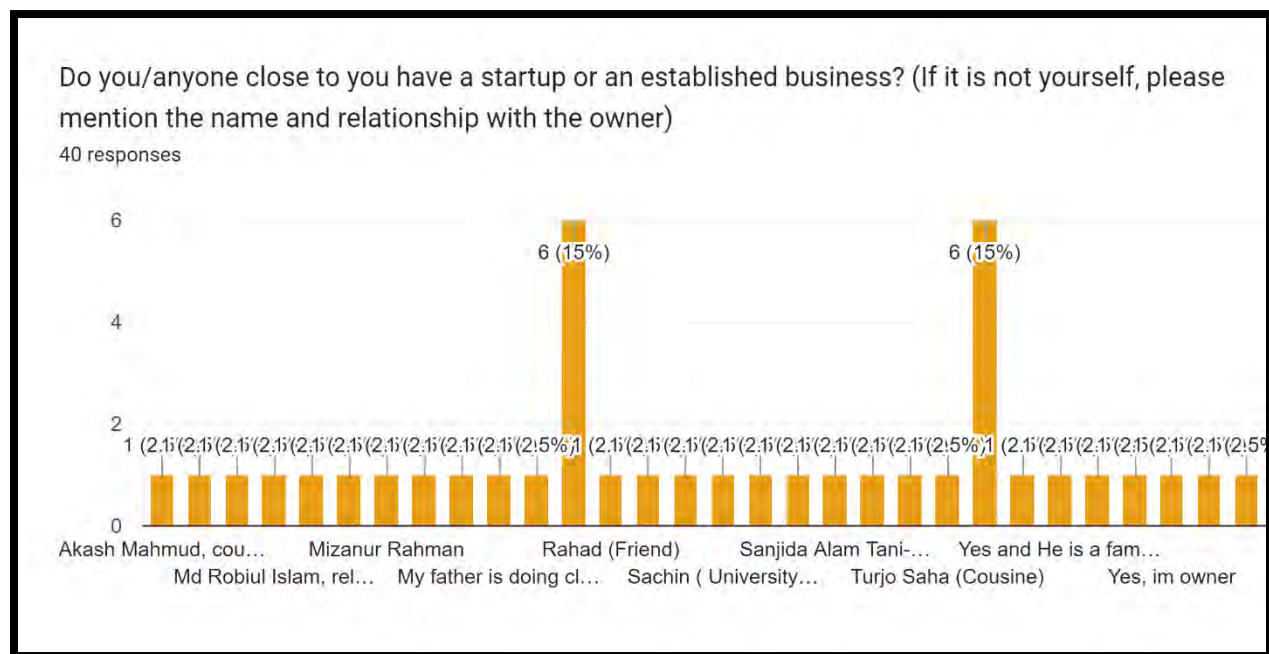
The sampling method that I am using is probability sampling. This is the sort of sampling that ensures the risk of biases by choosing a completely random sample from the population who are fit for the sort of research. To explain further, by following this sampling strategy, the study would be more accurate generalizing the result to the entire population.

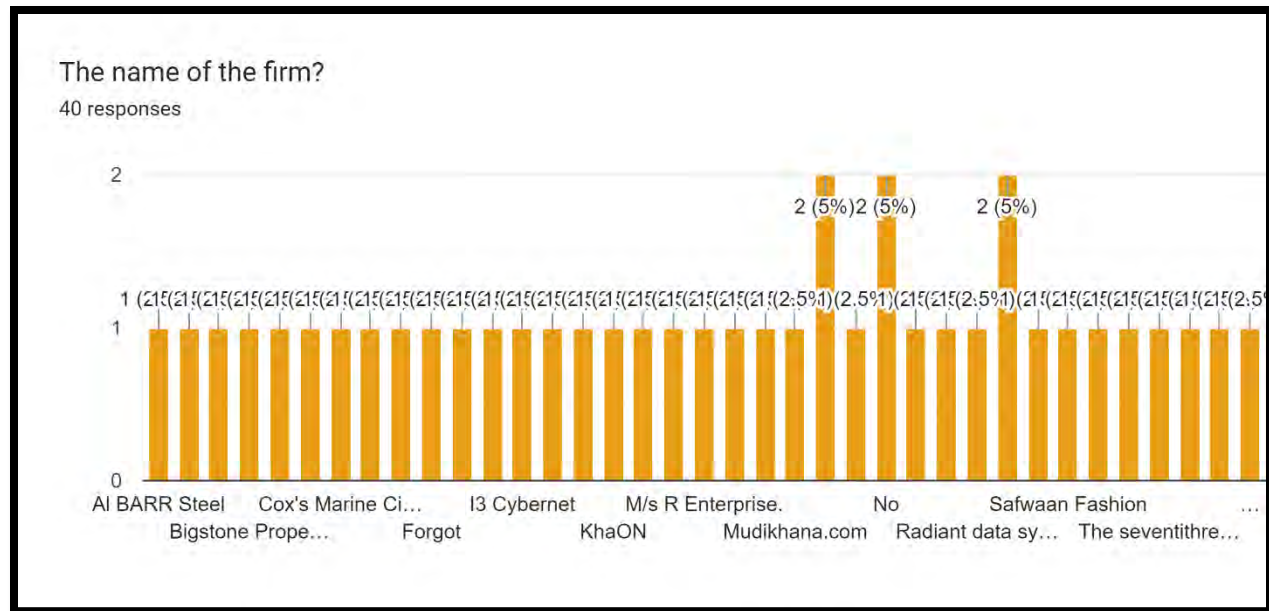
Data collection method:

The data collection method explains how the data for this research would be collected. There are several methods for data collection such as interviews, surveys, bio-physical measurements, observations, focus groups, documents and records, and so on. Among all others, I am going to work with only a couple of methods i.e., interviews and surveys. Furthermore, the type of data collection method for interviews would be semi-structured interviews.

Findings and analysis:

In this part, I am going to be explaining my findings from the analysis of the data that I collected for this project. Moreover, in the later parts, I will include multiple charts to explain the findings regarding the barriers that businesses face while integrating data-driven business solutions.





A couple of questions shown above have been asked to the sample to address what sort of businesses we have been working with in this paper. However, from the results of these questionnaires, we can easily conclude that, in general, some of my samples have their startups and others have businesses that are owned by either their family members or someone very close to them. Therefore, I believe, I have received accurate data from the responses I got from my sample, which helped to draw out the conclusion in an effective manner. From the responses, I got several established businesses as well as startups such as AI BARR steel, Cox's Marine City Hospital and Diagnostic Center, I3 Cybernet, KhaON, Mudikhana.com, Radiant Data Systems, Safwaan Fashion, Bigstone Properties, Mella Fish seed production firm and so on. Nonetheless, the participants who answered the questionnaires already got a brief idea of the research topic and wanted to know more about the emerging issues that prevent them from using data-driven software and systems for their organization.

What sort of **business** is this? Please elaborate further.

40 responses

Event management

This is a outdoor amd sporting goods company

IT Business

Education consultancy firm

Educational App

E-commerce

Sportswear Brand

Cafe

Infotech

What sort of **business** is this? Please elaborate further.

40 responses

Clothing Businesses. He is doing clothing businesses in Dhaka newmarket. He has 2 shops, Where he sell retail and wholesale.

Mella Fish Seed Production Firm is a specialized business focusing on the production and distribution of high-quality fish seeds. With a primary emphasis on supplying fish seeds, they also engage in selling fish across the country. Their core expertise lies in producing healthy, viable fish seeds for aquaculture purposes, catering to fish farmers nationwide. This firm likely plays a crucial role in supporting the aquaculture industry by providing essential stock for fish farming operations and ensuring a consistent supply of fish for consumption.

Event management is the application of project management to the creation and development of small and/or large-scale personal or corporate events such as festivals, conferences, ceremonies, weddings, formal parties, concerts, or conventions

Services

Helps business in decision making, provides solution if arises any problem in business.

By asking the two questions shown above, I wanted to know more about the businesses that I have been working within the paper. However, from the responses from my sample, I was able to find out details about the operations as well as the products and services these businesses offer for their wide range of consumers. For example, if I talk about the Mella Fish Seed Production Firm, I am unaware of their operations and their products and services. However, the response from the sample really helped me understand the operations, offerings, and distribution of the organization as well as the aquaculture industry. Nonetheless, I believe the paper would also disseminate vast knowledge about both the established businesses as well as the startups that need data-driven software and systems to efficiently lead to sustainable profitability.

Off the top of your mind, could you mention any other **reason/s** that could **allow** entrepreneurs **back out** from integrating data-driven business solutions in the organization? if so, please mention only in **bullet points**.

40 responses

The following points could be reason :

- Lack of knowledge regarding the importance of data-driven business solution
- High-maintaince

Not technology friendly, scared to adapt changes

Proper.management

Maybe the organisations being new could be a reason

- Cost of setting up the automation may seem significantly high if the pre assessed ultimate benefit don't attract the entrepreneurs.

Large investment

Security concerns

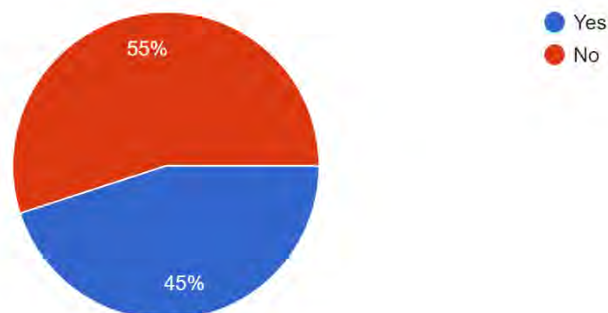
- Larger Manpower

The above question was asked to the sample to figure out why startups as well the SMEs and entrepreneurs back out from integrating data-driven systems into their organizations. However, among other reasons, some of the participants answered that employees or general people are not aware of the technological changes. Moreover, in general, people have less knowledge of operating and the significance of data-driven systems. They also mentioned not having specialized employees to operate the systems in the organization. From the addressed reasons for entrepreneurs to back out from integrating data-driven systems, we can easily figure out that the common reasons are as follows;

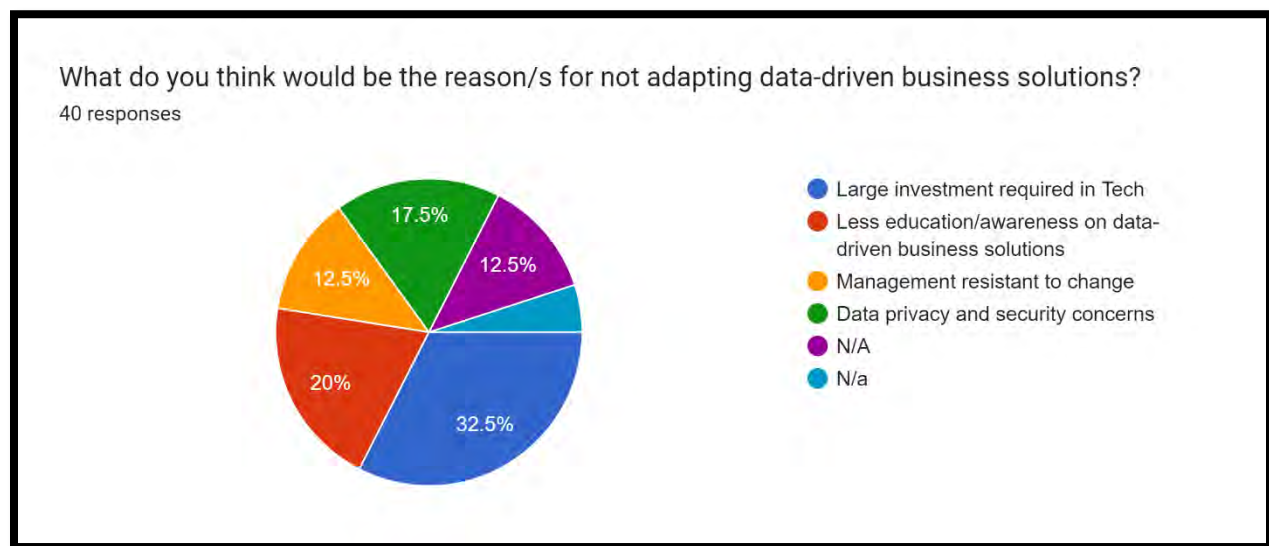
- Large investments
- Security concerns
- Maintenance costs
- Specialized employees
- Lack of knowledge and so on.

Does the organization uses advanced data-driven technological solutions to operate? (If yes, please avoid the following 2 questions typing in N/a and navigate to the 2nd section)

40 responses



Above is one of the questions that have been answered by some of the samples that I chose for collecting data from. However, most of the participants believe that the organizations they are in do not use data-driven business solutions to the fullest. To provide an exact number, 55% of the organizations do not use data-driven business solutions to run their businesses. They also mentioned that the consequences of not using systems are vast. For example, they do not have the proper number of their sales. They always face discrepancies at the end of every fiscal year while closing the books. Moreover, they also struggle to find out the problem as they cannot analyze without a system integrated into the organization. Whereas the other 45% of the total samples mentioned that their companies use data-driven business solutions for every department of the organization making efficient transitions in profit-making, decision-making, and finding out where exactly they have to make certain progress at the end of each fiscal year and moving on to the next. Therefore, from the analysis above we can conclude that most of the SMEs in Bangladesh do not use data-driven business solutions to operate, and the ones that use different systems such as ERP and CRM systems are way ahead in efficiently operating, profit-making, efficient decision making and finding out the areas of improvement.



Among other reasons for not integrating data-driven business solutions, there are some, which are the most common. From the data collected for this paper, many of the samples mentioned various reasons, why management does not think it is a great idea to integrate software and systems into the organization. However, from the findings, we can address that a chunk of 32.5% of the total sample believes that organizations need large investments to integrate data-driven business solutions, which is somewhat true. To elaborate further, if an SME has multiple departments and over 1000 employees, I believe, the organization needs to invest in ERP systems which tend to take a lot more than different modules of the system. On the other hand, if it is a small company having less than 500 employees, I believe, it is not needed for a whole ERP system integration incorporating different modules for different departments. However, from all the responses, management's resistance to change is also an important reason for not integrating the business solution. From the analysis above we can easily conclude that most organizations do not have data-driven business solutions because their management bodies are already fixated on the traditional approach of conducting business and show resistance to changes in the organization. Last but not least, according to the sample less education as well as unawareness of the data-driven business solutions are also a reason for organizations not integrating software and systems. The percentage for this reason is 20% among others.

To conclude, from the data collected, I was able to analyze and find the above interpretations in regards to not integrating data-driven business solutions into the organizations for sustainable profitability as well as efficient decision-making.

What do you think might be the **benefits** of using advanced data-driven business solutions? Please use **bullet points to answer this question**.

38 responses

Time-saving

- Helps in effective decision making, strategic long term planning and resources allocation
- Helps in analyzing the data and improve overall operation efficiency
- Helps in analyzing and interpreting customer data to get idea on how to increase customer satisfaction
- Helps in identifying recent market trends, market opportunities, doing competitive analysis and making decisions according to that

Easy accessible data
Protection from other
Managed properly

Will have advanced technologies support in vast portion with business

Better supply chain management is one of them.

- Better understanding of the consumer
- Target marketing

The question shown above has helped me figure out more benefits of using systems such as ERP systems, CRM systems, and modules of large ERP systems. After further analysis, I was able to find out the following benefits that usually come from integrating data-driven systems into organizations. The benefits are as follows;

- Better understanding of consumer behavior
- Identifying the target market
- Adapting different approaches of marketing for specific targeted consumers
- Easy access to data that helps bring out necessary conclusions
- Saves time for further analysis for departments
- Better supply and distribution management

- Effective decision making
- Finding out ways to increase customer satisfaction
- Figuring out market trends, fads, and opportunities
- Performing competitive analysis and making decisions based on the analysis
- Descriptive and predictive data analysis
- Exploratory and correspondence analysis and so on.

These are the benefits that make organizations step ahead of their competitors and gain competitive advantage across industries.

What do you think could be the **drawbacks** of integrating data-driven business solutions to operate businesses? Please answer in your own words using **bullet points**.

36 responses

- Sometimes the data driven business solutions make error and do not give proper information
- Technical expertise is hardly needed to use those data driven solutions and sometimes it is costly to hire people for a startup
- Implementing different data driven solutions are costly for the business
- Sometimes the process is complex and employees do not know how to use those

Lack of knowledge
Not many information
Not trained people to handle data

Lack of knowledge.

Cost of setting up eg. Hiring full-time analysts may be one of them.

Security concerns

- Security Issues
- Could be time consuming
- Data quality issues

Among other disadvantages of data-driven systems, there are some, addressed by the participants for this paper. However, after further analysis, I was able to figure out the drawbacks that organizations as well as entrepreneurs might face in regards to integrating data-driven systems. Furthermore, the below drawbacks also include organizations that have been using data-driven systems and software for quite a long time now. They are as follows;

- Errors in performing analysis
- Bugs in the systems
- For startups, quite impossible to integrate systems as they have limited resources
- Startups cannot hire specialized employees to maintain the systems due to the limitation of resources.
- Setting up servers can cost a large chunk of investment
- Data theft
- Various security concerns
- Complex analysis and data input processes
- System and Database maintenance need additional costs and advanced devices
- Lack of real-life or field experience for systems to generate accurate conclusions
- Data complexity and quality deficiencies
- Privacy concerns
- Expensive installation and maintenance cost
- Disregard of non-quantifiable elements for further analysis
- Decision-making delays.

These are the drawbacks of data-driven systems that are usually encountered by organizations as well the entrepreneurs.

Summary and Conclusions:

To summarize the whole paper, I would like to state that, the use of data-driven business solutions is vast and we are going to be needing systems and software more than ever to operate businesses in our country in the most efficient manner. As Bangladesh is a third-world country and most of the small and medium business owners are not aware of the new technologies that are emerging can make a huge difference across the industries. I believe they should be made aware of the changes in businesses and technologies to cope up with the new era. Furthermore, the analyses and findings that I was able to perform would help owners of the organizations as well as other individuals and groups to understand the power of data-driven business solutions and how they can change the way of conducting business most efficiently. There are some barriers as well as misconceptions that arise relating to systems and software whenever owners want to integrate business solutions, among all, large investments, change resistance, and unawareness of the technologies play a major role in not integrating systems and software. However, to eliminate these sorts of misconceptions everyone needs to be aware of the uses and benefits of systems and software. So, they can also understand the need for data-driven business solutions. Sooner or later, we have to rely on systems and software to make considerable progress across industries. Therefore, this paper would help readers get a clear image of the positions of the businesses of our country who work with systems and software and who do not. Moreover, readers would be able to understand and disseminate the significance of using data-driven business solutions leading to sustainable profitability, and efficient decision-making as well as in conducting business in the most efficient manner.

Recommendations:

After a proper analysis of the technology adaptation barriers, I believe I have some recommendations for business owners as well as people in general who already have a business or planning to go for a start-up. The recommendations are briefly explained below;

- **Investment in Tech:** I believe, while going for a start-up or already having an established business there is a vast need for technologies to maintain and allocate resources properly. Therefore, all sorts of SMEs need to invest in technology depending on the needs of various departments. However, if investments are scarce, I believe, with further discussions with the board, companies should reach out to investors for further investments so they can integrate systems and software. This will benefit both the start-ups as well as the established businesses making a profit and running the businesses in the most efficient manner.
- **Awareness of emerging technologies:** For both start-ups and established businesses the management running the business must be aware of emerging technologies as well as understand the uses of the technologies even if they are not ready or eligible to integrate them. So, they can compare and understand exactly when they need to install the systems into the organization and how they can eliminate or solve certain problems that occur while conducting business on a local or global scale.
- **Welcome change:** Most of the management or business owners do not welcome change in conducting business. They are fixated on the traditional approach to running the organization. Usually what happens is, these owners and management bodies use pen and paper for all the business transactions and resource allocation. As a result, they make a lot

of mistakes throughout the process as we are human and we tend to make mistakes no matter what. However, to avoid spending money on what they do not understand or trust, they do not welcome changes in terms of integrating systems and software into the business and do not make further investments in data-driven business solutions. As a result, they keep using the traditional approach and lag. And their competitors always stay ahead in the long run making considerable profit. Therefore, I believe, that to do better in every sphere, organizations must accommodate technological as well as managerial changes in conducting business towards sustainable profitability.

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