A CASE STUDY EXAMINING THE IMPACT OF BUSINESS INTELLIGENCE SYSTEMS ON START-UP COMPANIES' EXCELLENCE MANAGEMENT AND DECISION-MAKING PROCESSES

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Abstract: Meaningful and thorough information gathering is hardly feasible by manual methods due to the sharp rise in data volumes in businesses. Here, business information tools can be useful. They offer technologically suitable tools to help with data gathering, integration, storage, editing, and analysis. The market for Business Intelligence (BI) has been expanding for years, despite the fact that only very large organizations were interested in this subject a few years ago. In the meantime, start-up businesses have found it important as well. The basic benefits of BI adoption for startups are the main study area of this paper. The first things that will be looked at which BI solution providers are good for start-ups and what chances there are for BI system implementation in start-ups. The usage of BI techniques in start-ups, their purpose, and the extent to which BI has taken hold in start-ups will next be demonstrated. Lastly, consideration is given to the success determinants for BI projects in start-ups.

Keywords: Business Intelligence, decision-making, market analysis, start-ups, BI-Projects, BI-Providers.

1. INTRODUCTION

All market participants and businesses face new obstacles as a result of the growing globalization of markets, intense competition, and accelerating changes in customer wants and market conditions. Companies will eventually be able to demonstrate that they can adapt to these circumstances and that they can act swiftly and nimbly in response to changes.

Time controlling their expenses. However, precise knowledge of the present business and market conditions is essential for this reason. Sophisticated information and communication systems are employed to guarantee this and to give management the data they need for planning and decision-making. Several methods have been developed for these systems since the 1960s; they are currently referred to by several names, including Management Information Systems (MIS), Executive information systems (EIS), or decision support systems (DSS). In both practice and research, the term "business intelligence" (BI) has gained traction nowadays. BI covers methods for gathering, storing, processing, evaluating, and displaying corporate data.

Business intelligence has emerged as one of the most talked-about subjects in the German and global IT markets in recent years. The significance of companies has grown dramatically in this regard. Businesses can be helped to make their business-critical data and processes transparent and intelligent by implementing BI solutions. Employees will also be able to make wiser choices, complete tasks more quickly, and grow professionally over time. Businesses may boost added value, save costs, decrease risks, and improve customer and supplier relationships with BI systems, which is another benefit. Massive amounts of data are available without the usage of BI systems, yet they eventually spread uncertainty and eventually make business more difficult.

Only big businesses and corporations expressed interest in this topic a few years ago, but start-ups are now finding it more and more appealing. Intelligence in business. This is due, in part, to the fact that BI software is now more widely available and more reasonably priced for many start-ups. For instance, start-up-focused software providers (including SAP, Oracle, IBM, SAS, Microsoft, and open-source suppliers) are overflowing the BI industry. Conversely, nevertheless, mounting pressure from competitors and the robust demand is ensured by the need to always and promptly rely on trustworthy information.

In light of this, the purpose of this paper is to illustrate how business intelligence is used by startups and to provide a summary of suppliers offering business intelligence solutions that are appropriate for new businesses.

2. BUSINESS INTELLIGENCE

Howard Dresner, an analyst with the Gartner Group, coined the phrase "business intelligence" (BI) in the middle of the 1990s to refer to a broad range of ideas and practices that facilitate decision-making through the analysis, processing, and distribution of information. BI is now widely utilized in both research and business activity. There is still debate on how to interpret the phrase, though. There is an unclear range of definitions as a result of this uncertainty. It is challenging to draw a clear line because every term chosen has some degree of vulnerability. The term "business intelligence" was first used in 1996 to describe a set of tools that can assist business users in sorting through vast amounts of data and extracting useful information. These tools are now referred to as business intelligence. (Anandarajan, et.al. 2004).

Various architectures for business intelligence systems are described in the literature as a result of differing perspectives on business intelligence. Regarding the broad understanding of the term employed in this work, the references provide a variety of logical processes that serve as the foundation for a business intelligence architecture. These procedures are attributed to the distinct ideas and methods that are summed together under the umbrella of business intelligence.

The following BI architectural procedures will be identified in this paper:

➢ Gathering Data or Data Collection;
➢ Integrating Data or Data Integration;
➢ Storing Data or Data Storages;
➢ Information Processing or Data Processing; and
➢ Display of Data or Data Presentation

The operational systems that supply the necessary data for the business intelligence system are included in the data gathering. Ensuring that the processed data may be permanently stored in data storage or maintenance is the goal of the ETL process. Several architectural variations can be used to implement the data storage. Here Data Marts and Warehouses are employed. All ideas and instruments that are mainly focused on the assessment and analysis of the data are categorized as part of data processing or data analysis. As a result, analytical applications are given this level; they assess the data accumulated throughout the data storage procedure based on preset standards. Components for data mining, which finds patterns in data, and online analytical processing (OLAP) are also included in this procedure.

Various concepts are employed for this purpose, including OLAP clients for the development of premade reports particular to a target group or ad hoc inquiries. Additionally, dashboards or management cockpits, planning, and balance can be given to this level scorecards, which are getting more and more significant.

An overview of each process is provided in the Figure 1, which also identifies which components go with whatever process step.
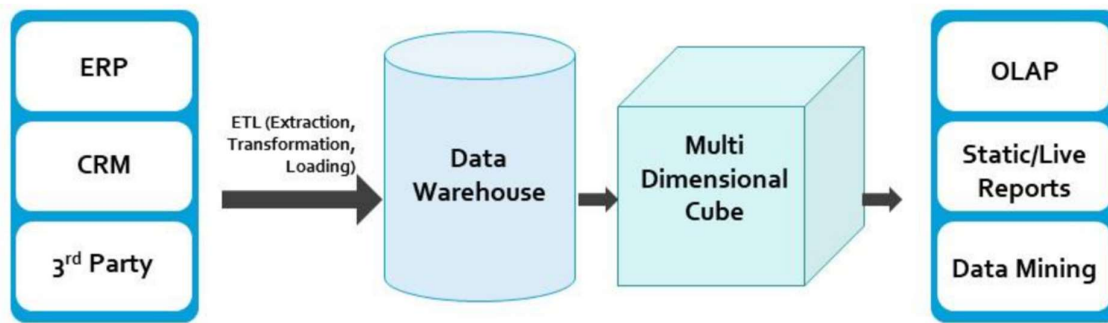
3. BUSINESS INTELLIGENCE'S OBJECTIVES

When making decisions in company, it's critical to have access to enough high-quality information and key performance indicators (KPIs). The primary issue, though, is the combination of data. Many records, spreadsheets, and databases are kept secret inside businesses and contain a wealth of pertinent data that is exceedingly challenging to compile and make available relevant data. Thus, it is necessary to develop a comprehensive, all-encompassing perspective that can serve as a foundation for choices. Thus, it is feasible to enhance added value, lower expenses, limit risks, and optimize corporate operations, among other things. Also, since the required data is essentially accessible with a mouse click, using BI can develop into a true competitive edge. The primary goals of using business intelligence are threefold. Enhancement of the decision-making basis: Information that is currently accessible is typically used to make decisions. Therefore, it is evident that the basis for the decision is significantly improved with greater information preparation and analysis of a variety of sources. Facts, or information, concerning specific topics are widely available in today's companies. They can be converted into a format that provides them with an information advantage in their day-to-day work thanks to the application of BI. Increasing corporate acts' transparency: The employee should be able to take charge of his area with the use of operational statistics and data, and BI should enable him to comprehend business decisions. Show how different pieces of information relate to one another. Given the complexity of business operations, actions made in many different areas of a company can have a significant impact. The goal of business intelligence (BI) solutions is to connect data from disparate sources and identify relationships that cannot be found in the separately examined sources of information. Since creating such data increases total transparency in business operations, only subject matter experts in the relevant industry should complete this knowledge component of business intelligence (BI).

4. REQUIREMENTS OF BUSINESS INTELLIGENCE

Business intelligence may be used to almost any kind of business, however not all businesses can

successfully apply it because of certain factors. Not only are there technical requirements to access pertinent information, but organizational culture and business intelligence methodology are also important considerations. The three prerequisites for BI may basically be summed up as follows:

1. **Ability to raise Questions**: Business Intelligence provides a platform to query long-standing practices in the industry. Changes can be examined suspiciously, new information combinations can be made, and altered structures can be analyzed. A broad range of confirmation is available if the information's fundamental structure is well-structured with respect to the technological specifications and the data organization.
2. **Ability to think outside the box:** New insights are generated using business intelligence. These must be made clearly able to account for things that appear senseless or unrelated at first.
3. **Management Focus:** Be aware that in order for BI projects to succeed, they must take one of the two approaches mentioned above. Still, it also implies that this is acknowledged by management. If the responsible management offers BI initiatives the support they need, they become much easier to run and more people are willing to engage in the processes.

In broader senses, the requirements of BI in business can be visualised from the following.

4.1. Dashboarding and Data Visualization

The solution should allow single-screen views of metrics divided into panels to show related data points. Dashboards must be web-accessible and conform to Web Content Accessibility Guidelines (WCAG 2.0 AA) and US Section 508 requirements. Complex data analysis and visualization require integration with Python and R libraries and third-party packages like D3. Among BI requirements, interactive visualizations are primary, enabling selection, linking, and drilling up and through data points. Adding animations to them help depict changes across groups or time periods, while automatic refresh shows the latest data. Branding is a crucial BI requirement. The ability to use custom font styles, logos and colors helps establish your company's identity.

Source: https://www.selecthub.com/business-intelligence/top-business-intelligence-requirements/
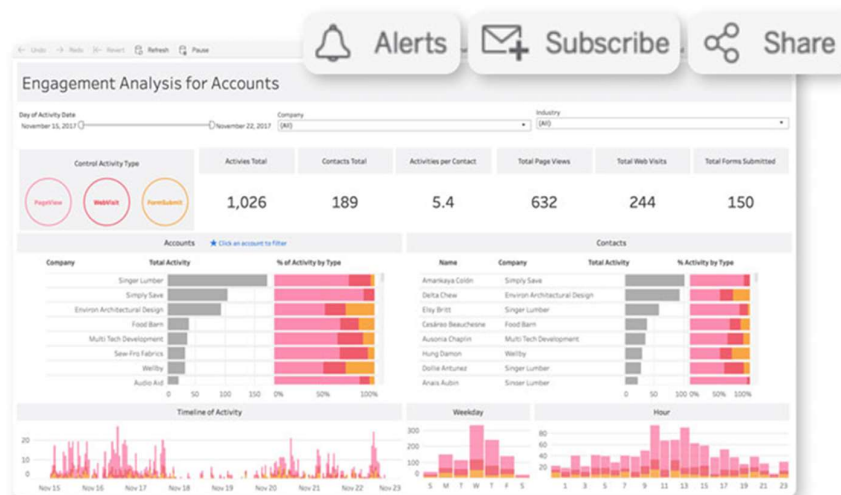
4.2. Data Management

Statistical and visualization techniques in BI solutions help uncover useful insights by blending structured and unstructured datasets. Preprocessing data — profiling, cleansing and transformation — before analysis gives you clean data for your calculations. Data modelling is a key BI requirement and helps map how the information will move between sources and the host application. Metadata management and data catalogues make it easy to find stored datasets. A BI tool supporting OLAP — roll-up, drill-down, and slicing and dicing — helps analyze multidimensional data. Implementing data governance enforces business rules compliance, providing a single source of truth for analytics.

Live connectivity enables direct querying against databases without storing a local copy. Batch updates offer a power-saving alternative by updating the records locally and regularly sending updates to the database. The solution should support your preferred data sources and provide a robust query editor for creating and modifying simple and complex SQL queries. Anyone, even non-technical users, should be able to run queries and schedule them to run later using visual drag-and-drop tools. In-memory analytics gives faster results, while multi-pass SQL drives parallel processing of large reports by splitting them into smaller components.

Source: https://www.selecthub.com/business-intelligence/top-business-intelligence-requirements/
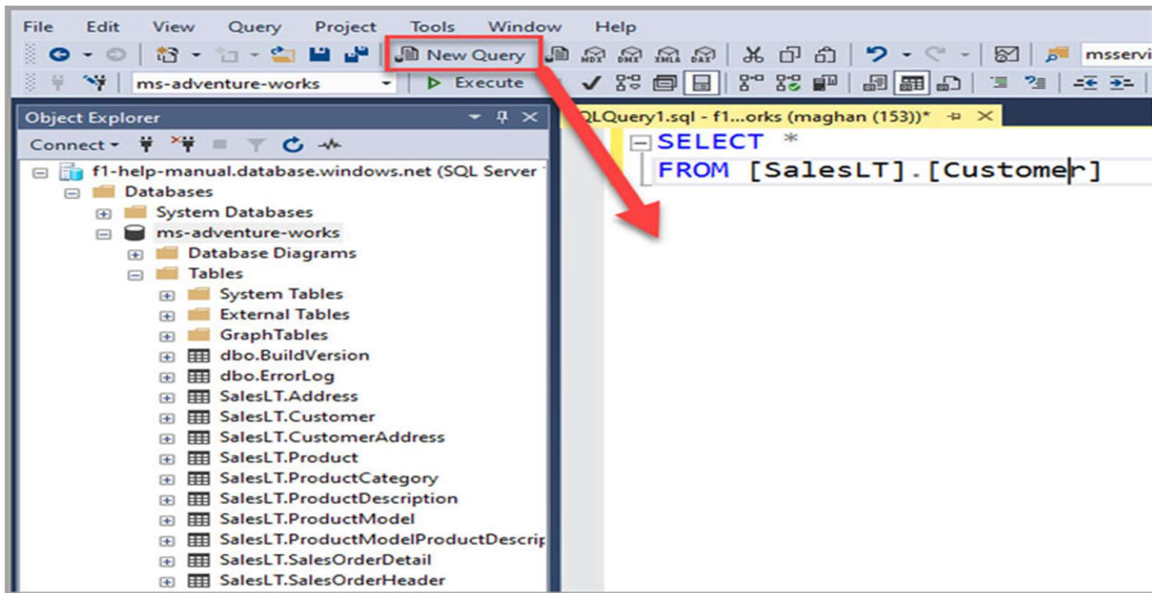
4.4. Reporting

Ad hoc reporting is a primary BI application. Self-service BI tools close the gap between technology and non-technical users, allowing them to generate on-the-fly and static reports on demand. Your BI tool should have something for everyone — technical users must be able to create and templatize complex reports. Scheduled and trigger-based reporting keeps you on top of your tasks and updates. Conditional formatting saves time by highlighting relevant cells.

Source: https://www.selecthub.com/business-intelligence/top-business-intelligence-requirements/
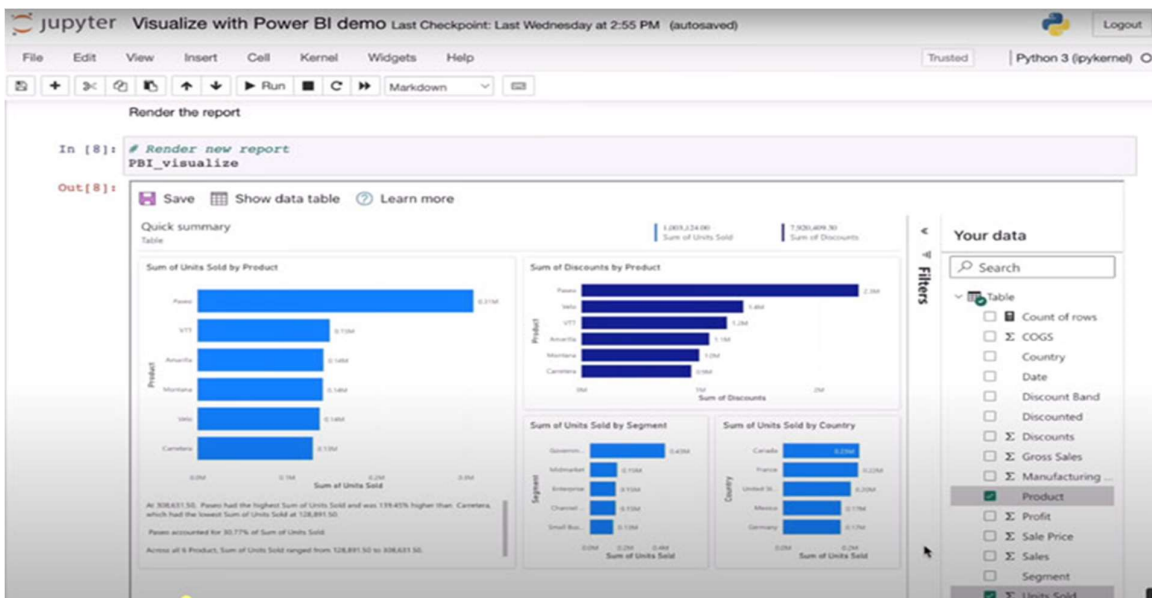
Report versioning ensures changes aren't lost, and you can revert to a previous draft if necessary. Exporting reports in HTML, Excel, CSV, and PDF helps share insight with internal teams and clients.

Written text summaries and voice reports using chatbots cover the last mile of analytics, giving you understandable information with a few commands.

4.5. Embedded Analytics

A BI application t embeds into your regular workflows adds value by avoiding unnecessary platform switching. The system should seamlessly run in the background with white labelling, providing data to the host application. Separate workspaces maintain the integrity of tenant data. Integrated workflow actions give you your money's worth by speeding up decisions and follow-up actions from the dashboards. You can pause orders from the inventory dashboard when it says stocks are surplus — no need to log into the ordering system. Secure write-backs keep your sources synced with the latest data changes.

Source: https://www.selecthub.com/business-intelligence/top-business-intelligence-requirements/

4.6. Geospatial Visualizations and Analysis

Does your business need location-based insights, and of what kind? Some BI tools may allow geographical searches by inputting addresses or area coordinates. And if you don't have that, map-based searches can be equally effective, provided your BI tool has the requisite integrations.

Support for shapefiles, MapInfo tables, Keyhole Markup Language (KML), TopoJSON and GeoJSON files enables robust visualization. Built-in Mapbox, Google Maps and Bing Maps integrations enhance your BI tool's geospatial capabilities. Besides mapping locations, geographical functions allow data transformations for analysis. Not every map suits every data type, so map libraries offer many options for your selected data points. Examples are proportional symbols, choropleth, dot distribution, flow, spider and dual-axis maps and heatmaps.

Source: https://www.selecthub.com/business-intelligence/top-business-intelligence-requirements/
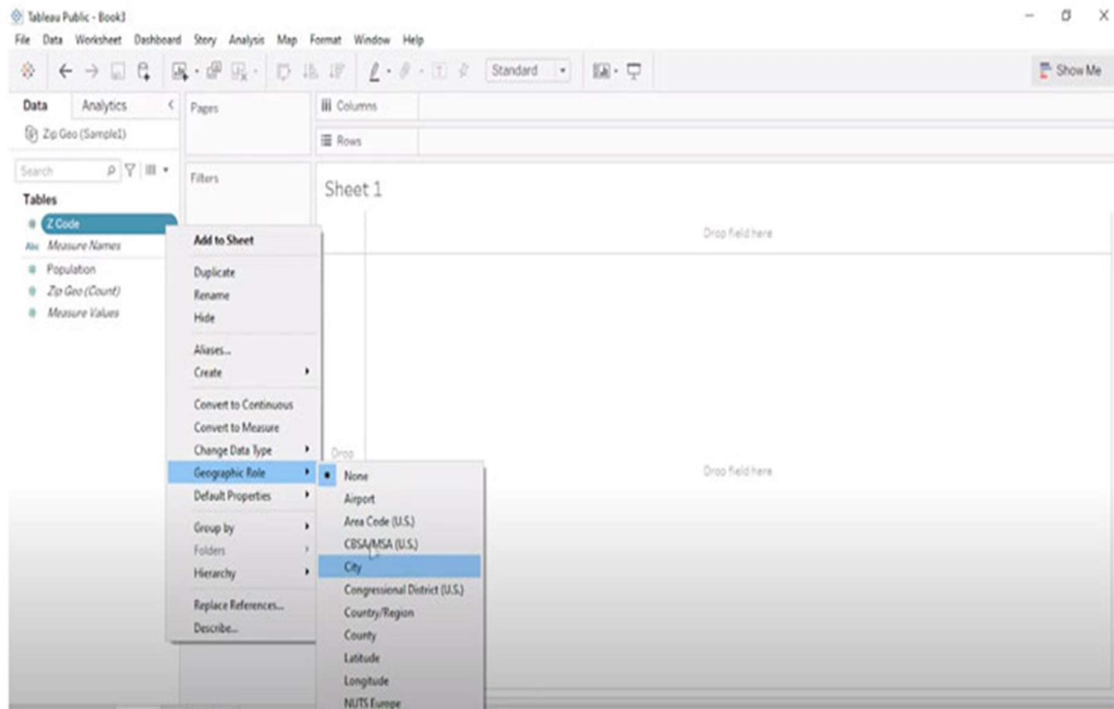
5. BUSINESS INTELLIGENCE PROVIDERS FOR START-UPS

➢ **Data Catalog Company**

Breaking new grounds in the BI landscape, Data Catalog Company is a pioneering startup that specializes in creating organized systems for data access. Recent achievements include successful Series B funding and an impressive growth rate in its user base.

➢ **SAP**

For many years, SAP, a German software vendor, has dominated both the domestic and global software markets, according to BI-Software. For start-ups, "SAP BusinessObjects Edge" provides an extensive and potent business intelligence solution. Features including flexible ad hoc queries and analytics, data connectivity, dashboards and visualization, and pre-configured data mart solutions are all included in the product to meet various BI demands. There are three versions of SAP BusinessObjects Edge: Standard, BusinessObjects Edge with Data Integration, and BusinessObjects Edge with Data Management.

➢ **IBM**

Business intelligence solutions are offered to startups through IBM Cognos products. Dashboards, balanced scorecards, reporting, analysis, planning, budgeting, and forecasting are some of the start-up tools available.

➢ **Oracle**

The Oracle BI system's "Business Intelligence Standard Edition one" is designed with startups' needs in mind. This is a full solution meant for five to fifty people. The solution includes extensive capabilities like mobile and predictive analytics publishing, ad hoc analytics, proactive intelligence

and insight, enhanced reporting, and interactive dashboards.

➢ **SAS**

SAS has introduced a customized business intelligence (BI) solution for startups with the SAS Business Intelligence - Edition M offering. Because of its modular design, the solution may be expanded to meet changing needs. The Edition M includes a Web Report Studio, a dynamic desktop interface, an add-in for Microsoft Office product integration, and a data integration component.

➢ **Kloudio**

Kloudio (which is acquired by Alation) stands out for its unique proposition of seamlessly integrating data sources, making data analytics accessible to non-technical users. In 2023, Kloudio Alation secured substantial Series A funding, reflecting its potential to revolutionize the BI space.

➢ **Alation**

Alation, a trailblazer in data cataloging, has been making waves with its AI-driven approach. Its recent partnership with top business intelligence companies has garnered significant industry attention, marking a milestone in its journey.

➢ **Celonis**

Celonis, a titan in process mining technology, continues to innovate with its powerful analytics capabilities. With robust funding under its belt, Celonis is set to redefine operational efficiency in businesses.

➢ **BI Startup Alpha**

One of the prominent business intelligence startups Europe, BI Startup Alpha offers a user-friendly dashboard that effectively communicates data insights. With a promising growth rate, it is a startup to watch in 2023.

➢ **BI Startup Beta**

Another noteworthy name among business intelligence dashboard startups, BI Startup Beta enables businesses to visualize data more effectively. Its recent Series C funding round underscores its potential in the European market.

➢ **AI Startup 1**

AI Startup 1 is a rising star in the AI startup companies' list, leveraging artificial intelligence to power BI solutions. Their recent patent for a unique data processing algorithm has generated industry-wide interest.

6. USE OF BUSINESS INTELLIGENCE IN STSRT-UPS

Businesses need access to current, trustworthy data at all times to make informed plans, whether they are related to inventory management, financial accounting, or storage expenses. In recent times, start-ups have also been using BI systems more and more. Particularly for data preparation or analysis (OLAP), data display (planning, reporting), data integration (ETL), and data storage (data warehouse). Reporting systems eliminate the need for a tedious and prone to error manual data collection process from many sources by automatically combining all measures into a single system and connecting them

in any desired combination. Consequently, business intelligence is now a crucial foundation for corporate decision-making. These days, hardly any sizable company operates without a BI system. These appeared to be designed exclusively for large enterprises due to the complexity of the solutions and the associated expenses of deployment.

BI solutions provide a significant competitive edge, particularly for startups. A corporation without a BI system has to put in a great deal of work to create a report: a ton of data must be manually retrieved from Excel spreadsheets, billing systems, and other programs and saved in a new file. This passes via the hands of multiple staff members. In addition to wasting important working time, this kind of procedure runs the danger of serious transmission problems. The data that was previously handled manually is extracted and managed entirely automatically if you choose to employ a systematic business intelligence solution. This greatly lowers the possibility of mistakes and conserves human resources. This is a huge relief, especially for startups where employees frequently handle many responsibilities.

This allows the organization to reduce its response times several times over. The time saved can be put straight toward the analysis as soon as a thorough examination of the company's financial records is no longer required. What are the expenses of production and storage at the moment? Which product sells the most at the moment? A BI system can quickly assist in providing answers to these questions. Quick and effective market reactions are only possible for people that are familiar with their numbers. Since their planning horizons are typically far shorter than those of major companies, start-ups place a premium on being able to respond rapidly.

Comparatively speaking to prior years, business intelligence is now widely used in startups. As a result, in 2007 just 50% of startup businesses were using BI applications. The state of the market has drastically changed nowadays. Currently, about 83% use a BI solution, with the remaining 17% utilizing Excel and operational systems (such ERP, CRM, or SCM).

The limitations of the alternatives serve as one of the main motivators for investing in BI software. Beyond ERP systems and spreadsheet apps, there is not enough functionality for generating reports, sharing reports, or arranging, scheduling, and coordinating various planners. Additionally, there are usually no data management features included, despite the fact that there are numerous ways to combine data from various sources and make use of central data memory that are accessible to numerous users.

Controlling (89%) is the primary use of business intelligence in startups, followed by management (70%) and sales (57%) as depicted in the figure that follows.
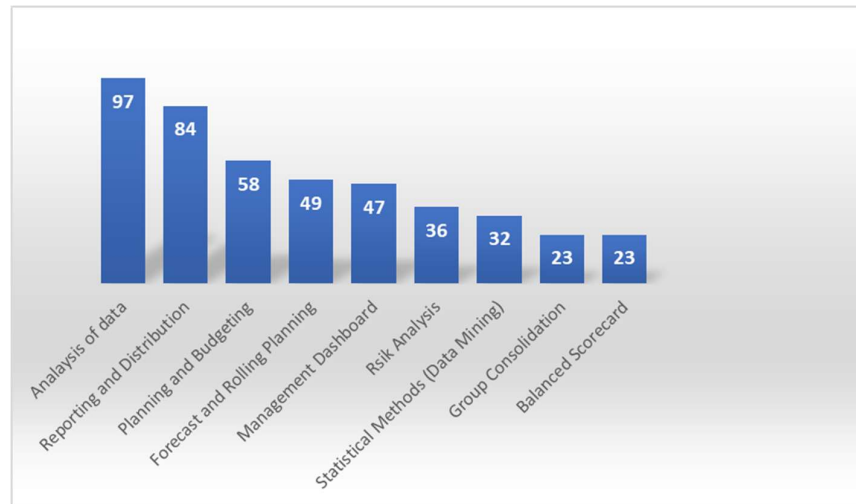
Figure 6.1: BI Application Domains for Start-Ups (BARC. (2012))

The areas of use for BI in startups demonstrate that traditional departments still tend to employ them. BI software is used to support the duties of controlling, central processing, business data reporting, and planning entities. Management extracts information that is relevant to decisions using BI data. BI is mostly used by sales for analyses pertaining to customers.
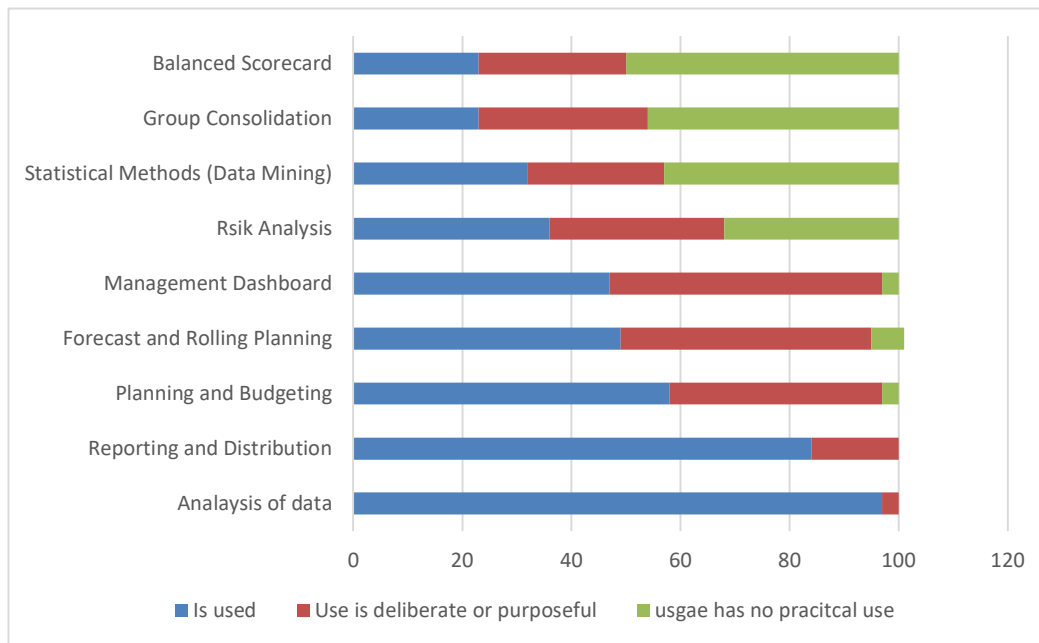
Figure 6.2: The goal of BI use in startups (BARC. (2012))

97% of newly established businesses utilize business intelligence in data analytics; 84% concentrate on creating and disseminating reports; 58% deal with planning and budgeting; and 49% deal with forecasting and rolling planning. Still, sixty percent of the newly established businesses intend to roll out better management dashboards later on. Revisions to planning are desired by 39% and forecasts by 46% of respondents. The figure 3 illustrates the most typical use of BI in startup companies.

The fact that BI software is by far the most popular for data analysis, reporting, and distribution should come as no surprise. The main areas of application are forecasting, rolling planning, planning and budgeting, and future developments about planned use. Users want to process already-existing data further and get more information from it. It appears that balanced scorecards, group consolidation, and statistical approaches (data mining) have not been extensively included into business intelligence tools in start-ups. Additionally, the data on anticipated or assessed beneficial utilization leads to the conclusion that they won't be crucial in the future.

Additionally, there are far fewer BI experts in startups. Regarding the introduction and application of BI, the organization needs to have the necessary capabilities on hand. There is a noticeable distinction between medium-sized and larger businesses here, which start-up businesses would need to address in order to enhance the implementation of BI.

7. BI PROJECT SUCCESS FACTORS IN START-UP ENTERPRISES

Effective content requirements profiles are the foundation of successful business intelligence projects, and they ought to be created in a technical concept before BI is implemented. Here, it is helpful to enlist outside conceptual assistance due to the companies' occasionally deficient knowledge. Aside from the regular tasks for BI, there is not much time for own workers. Consequently, a BI project's control and success are at jeopardy. Effective BI project management necessitates multidisciplinary proficiency combining leadership in the form of assertiveness, communication, and coordination abilities with specialized knowledge—above all, BI know-how. A combination of planning and reporting, increased flexibility, and handling of massive data quantities are some of the main advantages of switching to BI systems.

Businesses must comprehend data and be able to extract, sell, and build strategies around it. In this era of information, the significance of data cannot be overstated. In the post-pandemic environment, where changes are anticipated in many areas, the relevance would grow. As an illustration:

- ✓ In the supply chain, the supplier's health report may be the basis for purchasing consumable items.
- ✓ Product costs may vary depending on where you live.
- ✓ Sales representatives and customers may conduct all of their business online.

The reporting and planning addressee's participation in the creation of the requirement profiles is a crucial component of a successful business intelligence project. A brief assessment of the existing state of affairs aids in distancing businesses and their staff from one another, allowing them to capitalize on their advantages and prevent future setbacks. The specialized concept, which should include all content, process, organizational, and technological need profiles, is another crucial component of a BI project's success. Finding the elements that provide value and are strategically important is important when it comes to contents. The recommendations for the content design and presentation of the individual reports, as well as the reporting structure and navigation in the reporting and planning system, are also significant elements of the specialized notion. The IT concept for the BI solution's execution is based on the technical content concept. Primarily, the goal was to identify the technical data sources of the upstream IT systems, incorporate a data supply concept, and provide a technical description of the data modeling, query, and report design.

Data integration of all decision-relevant information from the variably available pre-systems is required; the BI should not be an isolated solution. The external help should be provided in accordance with the coaching principle and give the project core team the essential know-how transfer to BI. As a result, the business maintains its medium-term independence from other parties and is later able to create its own internal reporting system and plan. BI-based reporting and plan systems that were highly developed by employees themselves frequently end up being more well-liked and accepted by the business.

Controlling takes more time for BI to create analyses, conspicuous management comments, and suggested actions for the management bodies because it is a vital supporting body in the company's planning and reporting processes. Furthermore, new web-based application interfaces can coexist with the beloved Excel interface as an integrative element. During actual system operation, flexible analyses assist in identifying cause-and-effect linkages in the plant and its surroundings; this is bolstered by a variety of output media and the multiple ways in which information may be accessed via portals, the internet, and mobile devices. Additional advantages and downsides of adopting BI in startups are compiled in the following table.

Table 7.1: Benefits and Drawbacks of BI Implementation for New Businesses

Benefits	Drawbacks
➢ Features for focused, efficient research that let you locate and display pertinent data in an up-to-date, standardized manner ➢ Access to information is prepared based on factual and problem-related, sometimes multidimensional criteria. Tasks and issues are illustrated with relevant, practical models. ➢ Processing and evaluating information using strong techniques ➢ Results are presented in easily understood formats using a variety of multimedia techniques (data, texts, graphics, images, and language). ➢ Support is also provided for one's own work organization, such as scheduling. ➢ Encourage collaboration while working together to complete tasks using collaborative solutions. ➢ Data and knowledge banks' security of information and knowledge. ➢ Assist in creating a useful knowledge management system. ➢ Control and openness in company operations	➢ Technology issues (concerning development platforms, hardware technologies, and the BI software product itself) ➢ Development issues (engineering issues brought on by challenges with the work domain, the tools, and the developers) ➢ Application issues (the intricacy of the application domains) ➢ Issues with maintenance (such as inadequate or absent care and upkeep) ➢ Issues with acceptance and responsibility (the user) ➢ Issues with qualification (for each participant) False expectation issues (inaccurate evaluation of BI tools)

➢ Reasoning and verifiability of managerial choices resulting from the ongoing preservation of data.	

It is the responsibility of start-ups to identify and honestly discuss the advantages and disadvantages of BI both before and during use. It is necessary to recognize and seize the advantages that are provided in order to gain both operational and strategic advantages. The negative impacts, which frequently manifest as weak signals, must be recognized and countered by limiting or averting negative outcomes. In the end, the ability of start-up management to maximize benefits, minimize drawbacks, or prevent adverse outcomes can be used to gauge its proficiency. Benchmarks can be created using more than just economic factors, which are represented in productivity, cost, and output variables.

Businesses who have already implemented business intelligence (BI) are undoubtedly at a competitive advantage when it comes to assessing the "impact" and "degree of change" of the modified procedures on their bottom lines. The three important critical success factors of BI implementation in start-ups are as under:

7.1. Be adaptable while selecting the mode of delivery

➢ **Scrum**: With 54% of agile projects utilizing it, Scrum is the framework that firms use the most frequently. The sprint is the core of the agile process. It is incremental and iterative, protected and time-boxed, and it is agreed upon that the team will finish 'X' story points, depending on its capabilities.

- MVP is defined
- Scrum Team has clear understanding
- Stakeholders are aligned with goal
- Active participation in sprint ceremonies
- Expected working software in ~3-6 weeks

Source: https://www.nagarro.com/en/blog/critical-success-factors-bi-implementation

While many agile fans believe that working software can be provided sprint by sprint, stakeholders usually prefer to see a trend when BI-based products are delivered. Before choosing the best product, they want to observe a top-to-bottom flow of information.

➢ **Kanban:** Keeping the planning cycle short (as little as a plan for one day or for a single item) allows the team to concentrate on cycle time and deliver the highest priority item, which is one of the finest things about Kanban. Kanban functions best during the early phases of a project, when the team is going through a learning curve and is referred to as the discovery period. The stakeholder and the availability of the required infrastructure make it easier to select a task. For instance, the team may be working on comprehending the dataset, gaining access to an existing database, creating data lakes, putting a new application on servers, configuring the ETL process, and other duties during the

discovery phase. If the development team applied Kanban, they would always have options from the backlog to choose from each day.

➤ **Scrumban:** The scrum framework, or scrumban, combines the flexibility of Kanban with the planning of scrum. Every ritual in Scrumban is the same as in Scrum, including sprint demonstrations, daily stand-ups, sprint planning meetings, and retrospectives. Like Kanban, it also makes frequent modifications to your current sprint possible. Scrumban also has the benefit of not grilling the team for committing to and completing the scheduled story points. According to this paradigm, planned items may be eliminated or given a lower priority if the needs of the business change throughout a sprint.

7.2. Create a culture for self-service analytics

An organization's leadership plays a crucial role in the implementation of business intelligence. The organization's executive team must guarantee that analytics can be performed after the new BI-related tools are implemented. When a new application, such an ERP or CRM system, is implemented, the IT (development) team is always required to code and deliver it. IT (support & maintenance) is the only resource available to address issues during the post-production period; this could take one to three days. However, some tasks must be completed quickly. In the area of business intelligence, there's a good chance you could miss the things if the lead time for any change is three days.

Let's consider the use case of a publishing business that needs to compare the earnings of different genres. A business team member is examining an interface that displays all of the sources. The member can choose data points or filters to develop and share the dashboard after obtaining the data from sources. The actions a team member or business owner can take to develop a relevant dashboard are shown in the following image (see Figure 4):
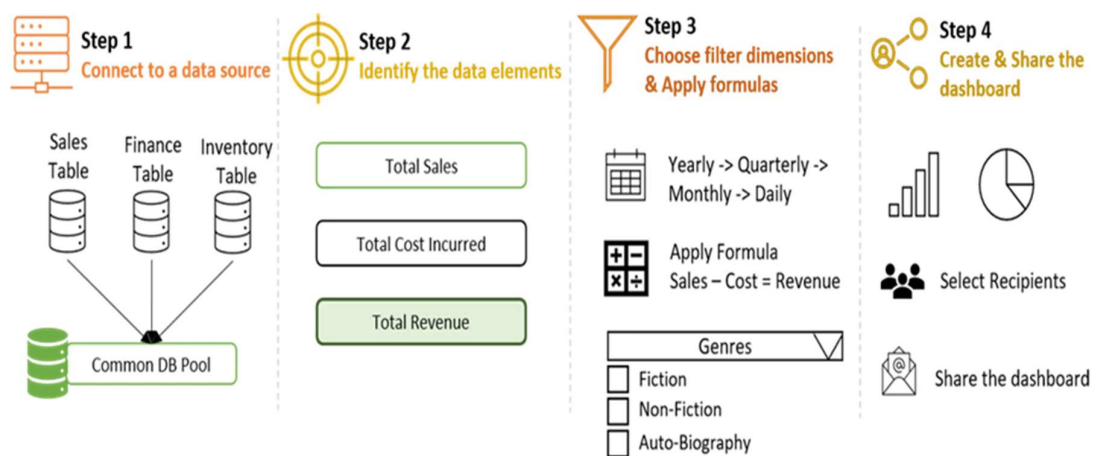

Figure 4: *Steps to create a meaningful dashboard*
Source: https://www.nagarro.com/en/blog/critical-success-factors-bi-implementation:

6.3. Storytelling through visualization

Data visualization that is intended for leaders and stakeholders must be done in a way that the audience can relate to, comprehend the reasons and problems, and initiate a dialogue towards finding a solution.

A visualization should give the audience the overall picture by taking them on the journey they have taken together and outlining the current circumstances.

8. RESULTS AND CONCLUSIONS

This paper aimed to provide an overview of the present trend of business intelligence in start-up enterprises. Business intelligence is a useful tool for start-ups and successful management. The BI systems transform the ever-growing volumes of data from the many operational systems into information that is useful. The executives' everyday tasks are supported by the BI tools for central database analysis and evaluation, which also serve as the foundation for strategic choices.

Moreover, the outcomes of BI support the corporate analysis that is currently underway. This can gain a competitive edge, cut costs, eliminate risks, shorten processes, enhance customer and partner relationships, and streamline business operations.

For BI to be implemented successfully, startups must take a wide range of technical requirements and difficulties into account. Evaluations are getting longer and longer and include a lot of detailed information about the organization. A company-wide BI strategy can be effectively developed and structured with the use of a business model. Creating an appropriate BI strategy is also essential for long-term, successful BI projects in startups. The business intelligence market has been gradually growing in the past few years, and the major players in it—SAP, Oracle, IBM, SAS, Microsoft, and Open Source—continually hold a significant amount of market share. These businesses provide start-ups with software that can effectively manage the five business intelligence tasks: data collection, integration, storage, processing, and display. Additionally, the BI market as a whole is split into the BI user. BI data management (BI backend) and tools (BI front ends). OLAP and multidimensional databases, data mining, dashboards, balanced scorecards, planning, reporting, and consolidation are examples of BI front-ends. Relational or analytical databases, as well as software for data integration, master data management, and data quality control, make up the BI backend of BI systems. In theory, a lot of front-end initiatives were started as startups, while back-end infrastructure investments are still on hold. Future predictions indicate that more start-up businesses will likely embrace BI systems, which will lead to an increase in user references. As a result, as needs rise, BI software will become increasingly more crucial and play a more significant role in startups. In order to react swiftly to changes or act more effectively by making predictions in less time, there is a tendency toward ever-faster and more detailed outcomes. In the future, basic office programs—which are still utilized by many startups today—will not be adequate for business intelligence needs.

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