Google business intelligence notes

Module 1: Foundations of Business Intelligence

**Business intelligence drives change**

As you have been learning, a business’s ability to identify issues before they become problems or act on opportunities before their competition is key to intelligent decision-making. Now more than ever, we have access to data about our marketplace, organizations, customers, competitors, and employees. But in order to turn that data into rapid results, we need business intelligence. Business intelligence involves automating processes and information channels in order to transform relevant data into actionable insights that are easily available to decision-makers.

In this reading, you’re going to explore two examples of how BI has helped real businesses gain insights, access the right data, and find ways to grow and improve their processes to put those insights to work.

**Restaurants reducing waste**

Consider a fictitious scenario about a fast-food restaurant chain. Leaders at this company have huge amounts of data to manage, such as:

* customer transactions
* marketing data related to promotions
* customer satisfaction
* employee information

And so much more! But on top of all of that, the company also has to consider the logistics for individual restaurants. That’s where the problem comes in.

**The problem**

The restaurants need to have ingredients to cook and serve customers, but if they have too much, that extra stock often goes to waste. Company leadership consults with their BI team to consider how to approach two concerns:

* How to ensure the restaurants’ numerous locations have enough ingredients to meet customer demand
* How to reduce food waste

However, these stakeholders currently don’t have metrics in place to specifically measure food waste or strategies to reduce it. This is exactly where the BI team will need to start.

**The solution**

In order to address the stakeholder’s needs, the BI team spends time gathering information about current metrics and processes. They first use this information to determine what data they have and how it’s being used. They discover that there are already useful metrics being applied in other ways by various teams in the company, including:

* How many ingredients are delivered to each location
* How much of each menu item is made each day
* How much of each menu item is actually being ordered each day

By comparing these existing metrics, the company can better understand how much food is going to waste. Thus, the BI analysts are able to gather the necessary information on incoming food delivery, customer orders, and food consumption in the form of a dashboard for stakeholders to monitor food waste. The BI analysts then organize this data within the database systems and deliver it to new tables that report the results for stakeholders to consider as they strategize how to reduce food waste.

**The results**

Knowing how much food is actually going to waste now enables stakeholders to better achieve their goals. The restaurant chain discovers that the largest source of food waste is the French fries. Across their locations, 10–20% of French fries are left over at the end of the month. With this information, the company’s central operations team sends out a memo to all branches recommending they reduce their incoming French fry delivery by 10%. In this way, the BI analysts are able to help the business identify an area for improvement and reduce waste.

**Hospitals promoting patient care**

Hospitals also have to manage a lot of different kinds of data — especially patient information. They also have a variety of data sources that they need to access and share to ensure that other connected users — such as doctors working outside of the hospital — can get patients the treatment they need without wasting time or resources.

**The problem**

For this scenario, consider a hospital system that’s challenged to communicate effectively with doctors who don’t work within the same hospital system. Administrators have noticed that this creates a few different problems:

* Doctors outside of the system can’t access test results from the hospital
* Patients are being tested multiple times

This is expensive and inefficient, both for the hospital and patients. So, decision-makers choose to work with a team of BI specialists to create database systems that get data in the hands of doctors who need it.

**The solution**

Basically, this hospital system is experiencing a problem related to inaccessible patient data. There is a lot of data streaming in from multiple source systems that needs to be consolidated into one destination that can be used by doctors, including information about:

* Previous visits
* Tests
* Allergies

And other relevant medical information. So, the BI team develops a pipeline system that ingests data from all key sources, processes and transforms it so that it is consistent, and delivers it to a database system where doctors are able to access all the information they need.

**The results**

By streamlining the hospital’s many data sources into one consolidated database, the BI team helps save the hospital money and resources by eliminating duplicate tests. Now, doctors are better able to treat patients, patients save money on redundant tests and procedures, and the hospital can run more efficiently. This is all thanks to the tools built by the BI team!

**Key takeaways**

No matter what industry you’re working in, BI can automate processes and information channels to empower the people who need that data to answer questions and make decisions. From restaurants reducing waste to hospitals advancing patient care, BI analysts create systems and tools to anticipate needs and enable organizations to reach their objectives.

# Collaboration with business intelligence partners

Previously, you learned about the many different partners a business intelligence professional might team up with to create systems and tools for an organization to improve processes and provide stakeholders with ongoing insights. These partners could include:

* API professionals
* Data warehousing specialists
* Data governance professionals
* Data analysts
* IT professionals
* Project managers
* And many more!

Complex business problems require collaboration and cross-team cooperation. These partners have unique knowledge, experience, skills, and perspectives to bring to the table. Brainstorming and building together, pooling knowledge, and fleshing out issues is essential to the BI process.

Tackling complex problems is related to a concept you might already be familiar with if you completed the Google Data Analytics Certificate: structured thinking. Structured thinking is the process of recognizing the current problem or situation, organizing available information, revealing gaps and opportunities, and identifying the options. Basically, structured thinking allows you to break a problem down into manageable pieces.

The same is true for BI. Often, you have a complex problem with a lot of pieces to consider; by using a structured approach and breaking down the problem to manageable pieces, the process to solve the issue and get results is much easier. And your partners in the organization are a great resource along the way.

Now, let’s explore some examples of BI professionals collaborating with their partners to solve problems and provide insights to stakeholders that empower decision-making.

### Managing membership data

The marketing team for a retail store was looking for ways to increase memberships for its loyalty program. Leaders wanted to encourage repeat customers to enroll. However, they didn’t have a system in place that allows analysts to explore both member and nonmember sales data. This requires ingesting data from a variety of systems, including the store’s online membership form and sales data. So, in addition to building a tool that moves and transforms key data, the BI team also needed to make the data from different systems align with the destination system.

In this case, they collaborated with several teams:

* **The marketing team**: The marketing team was the primary stakeholder for this initiative. They worked with the BI team to determine project requirements, timelines, and deliverables.
* **The API team**: Next, the BI team collaborated with the API professionals in order to integrate the data into the internal company database. The API team also helped build the reporting tools and dashboards.
* **Data warehousing specialists**: Then they teamed up with data warehousing specialists to create a storage and organization system for the newly acquired data.

In the end, the marketing team was empowered with a system that allowed them to access the data they needed to explore customer trends and strategize ways to increase membership for their loyalty program.

### Securing sensitive data

Another BI professional was working at a tech company that creates health-monitoring tools such as smart watches. The data analysts on their team were interested in exploring user data to find out how customers are using their products. Because some personally identifiable information was included, it was critical that all data be anonymized and secured.

The BI team partnered with the data warehousing specialists and data governance team in order to make sure that the storage systems protected the users while allowing data analysts to draw insights. In the end, the data analysts were able to use the smart watch data to explore trends and provide insights while still maintaining the privacy of users.

## Key takeaways

Collaborating with the people on your team who have different skills and perspectives is an important part of a structured approach to BI. As a BI professional, you will collaborate with a variety of partners to create systems that empower stakeholders with data to advance and succeed.

If you earned the Google Data Analytics Certificate or have experience working with data, you probably know that data analytics and business intelligence have both similarities and differences. In many ways, BI builds on tasks that data analysts perform. Often, data analysts are the stakeholders for whom BI professionals develop systems. In this reading, you’ll compare and contrast DA and BI to explore more about these similarities and differences.

| **Data tasks** | **DA** | **BI** |
| --- | --- | --- |
| Involvement | The first step of the data analysis cycle is to define the business problem and establish stakeholder expectations. | In addition to defining business problems and asking questions to establish expectations, BI professionals observe current processes to determine how they can be improved to align more with stakeholder needs. |
| Answering questions | Data analysts are often tasked with deciding what data they need to answer their stakeholders’ questions and gathering that data for use. | BI professionals evaluate the data needs of their stakeholders, identify necessary sources, and design pipeline systems that automatically and continuously gather that data for stakeholders to access. |
| Gathering data | Once data has been gathered, data analysts must ensure that it is clean and ready for use. They also perform transformations on the data to prepare it for analysis. | BI professionals build tools that clean and transform data automatically within a pipeline so that these processes occur to all data being ingested by the pipeline process. |
| Storage systems | Data analysts must adhere to organization conventions and store historical data for analysis. | BI professionals develop storage systems that allow intake from multiple source systems into a destination database, while governing the database schema and optimizing the system. |
| Descriptive and predictive analytics | Data analysis focuses on descriptive analysis that describes historical trends. | BI uses analysis of historical trends to perform predictive analytics that enable organizations to determine likely future trends and act accordingly. |
| Presenting insights | After analysis, data analysts present their findings to inform the stakeholders’ ultimate decision. | BI analysts create tables, reports, and dashboards that empower stakeholders with access to the data they need to inform their whole decision-making process. |
| Iteration | After the initial analysis, data analysts may repeat their analysis based on their findings or new information. | BI analysts continue to iterate on processes to improve and optimize the systems and tools they have built to ensure they continue to be useful for stakeholders. |

DA and BI share a lot of common ground: They are both fields in which professionals use data to create insights that inform decision-making. But BI is more focused on creating processes and information channels that transform relevant data into actionable insights that are easily available to decision-makers on a continual basis.

**Key business intelligence documents**

Previously, you learned about business intelligence strategy, which is the management of the people, processes, and tools used in the business intelligence process. BI projects are complicated, and finding ways to stay organized from the beginning of a project to the end is key to success. One way to ensure that you capture the big-picture project requirements, stay organized, and make an impact at your organization is to create comprehensive BI documents. In this reading, you’ll learn about three types of documents: the Stakeholder Requirements Document, Project Requirements Document, and Strategy Document.

Each of these documents builds on the previous one. Instead of three separate documents, think about them as three phases of your project planning process. Later on, you will have an opportunity to create your own BI documents to guide your end-of-course project, so this is a great resource to get you started!

**Stakeholder Requirements Document**

The Stakeholder Requirements Document enables you to capture stakeholder requests and requirements so you understand their needs before planning the rest of the project details or strategy. It should answer the following questions:

* Business problem: What is the primary question to be answered or problem to be solved?
* Stakeholders: Who are the major stakeholders of this project, and what are their job titles?
* Stakeholder usage details: How will the stakeholders use the BI tool?
* Primary requirements: What requirements must be met by this BI tool in order for this project to be successful?

Here are some questions BI professionals ask in order to successfully complete this document:

* What questions must be answered before starting this project?
* What does the BI team need to know before starting this project?
* What are the questions that must be answered/problems that must be solved by this project?
* What datasets are considered important to this project?
* Who should have access to the dashboard? Will the entire dashboard be visible to all stakeholders?

Typically, the Stakeholder Requirements Document is a one-pager with notes, but it can be longer and more detailed for complex projects.

Click the link to access the stakeholder requirements document template, or download the file directly from the attachment below. [Stakeholder Requirements Document template](https://docs.google.com/document/d/11K4eqc_rhZql__yg9sqDYFP5GnV1dAkHr36NqIUyG5I/template/preview)

[Stakeholder Requirements Document - TEMPLATE](https://d3c33hcgiwev3.cloudfront.net/UY7vQ0DkThyO70NA5B4cHA_c432d9155e234946baefb9fb125d9df1_Stakeholder-Requirements-Document---TEMPLATE.docx?Expires=1706400000&Signature=ENjuuRQj9ytg8i4xrdE1-H6Xk~Lvox9h7~~ewH3QCDjUmKIwyOuP0wF-VoCZp0F9O6avlnN-zLYu840HzfhSPYNO-Oyd4ha~topxepWdUt8n4CpQnVVO8RnV8ikOiA017OM0jfm10MMiYV4GI5PBkxKnHc5KCItDFb8T0Z9IlNk_&Key-Pair-Id=APKAJLTNE6QMUY6HBC5A" \t "_blank)

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**Project Requirements Document**

Once you have established the stakeholder requirements, you can start thinking about the project requirements that need to be met to achieve the stakeholder requirements. The Project Requirements Document contains the following details:

* Purpose: Briefly describe why this project is happening and explanation of why the company should invest its resources in it.
* Key dependencies: Detail the major elements of this project. Include the team, primary contacts, and expected deliverables. Are there any inter-team deliverables required?
* Stakeholder requirements: List the established stakeholder requirements, based on the Stakeholder Requirements Document. Prioritize the requirements as: R - required, D - desired, or N - nice to have.
* Success criteria: Clarify what success looks like for this project. Include explicit statements about how to measure success. Use SMART criteria.
* User journeys: Document the current user experience and the ideal future experience.
* Assumptions: Explicitly and clearly state any assumptions you are making.
* Compliance and privacy: Include compliance, privacy, or legal dimensions to consider.
* Accessibility: List key considerations for creating accessible reports for all users. Who needs to access this feature? How are they viewing and interacting with it?
* Roll-out plan: Briefly describe the expected scope, priorities and timeline. Consider at what points during the rollout will measurements be made to determine whether the feature is performing as expected? Is there a rollback plan and timeline if this feature does not meet its intended goals?

In addition, some companies will ask you to include a list of references. If so, it’s a best practice to be liberal in citing references; you can never have too many. References might include:

* Documents or websites you read and researched while working on this project
* Laws and policies: Any regulations driving the project requirements
* Project tracking: A link to tracking spreadsheet, bug hotlist, etc.
* Similar projects: A description of anything similar that has been attempted in the past or any parallel efforts.

Similar to the Stakeholder Requirements Document, the Project Requirements Document will vary depending on the complexity of the project. It might just be an email sent out to stakeholders to keep them updated on expectations and check-in points, or it could be a multi-page document with a spreadsheet that outlines the project plan and key tasks.

Click the link to access the project requirements document template, or download the file directly from the attachment below. [Project Requirements Document template](https://docs.google.com/document/d/1Vq9G_MAQRz4V6iZF_Z-v_u0AcwloB96lc6wwYzz9EDg/template/preview)

[Project Requirements Document - TEMPLATE](https://d3c33hcgiwev3.cloudfront.net/UHjoo0QQQb246KNEEOG9Gg_a479b463778d406493725900743d78f1_Project-Requirements-Document---TEMPLATE.docx?Expires=1706400000&Signature=hOAMxCKgyhWkd-IJLs5HtcSOb5rUUT2g4gtoZJ2hgGtYZg3RSsXX3nmZaLueaCxSAeuryU2FXD0CVfsUf-Pj9e75MuCqWWwi5eGPbhR0Vhp4IFgI9VeiHKWiqRWaOp2Nb~btAJdGy7mFBTsCb81YkCDyeweEGKloYmrs-U7BUAM_&Key-Pair-Id=APKAJLTNE6QMUY6HBC5A" \t "_blank)

[DOCX File](https://d3c33hcgiwev3.cloudfront.net/UHjoo0QQQb246KNEEOG9Gg_a479b463778d406493725900743d78f1_Project-Requirements-Document---TEMPLATE.docx?Expires=1706400000&Signature=hOAMxCKgyhWkd-IJLs5HtcSOb5rUUT2g4gtoZJ2hgGtYZg3RSsXX3nmZaLueaCxSAeuryU2FXD0CVfsUf-Pj9e75MuCqWWwi5eGPbhR0Vhp4IFgI9VeiHKWiqRWaOp2Nb~btAJdGy7mFBTsCb81YkCDyeweEGKloYmrs-U7BUAM_&Key-Pair-Id=APKAJLTNE6QMUY6HBC5A" \t "_blank)

**Strategy Document**

Finally, you will create a Strategy Document for your project. This is the final phase of the planning process. The Strategy Document is a collaborative place to align with stakeholders about project deliverables. You will work together to establish information about dashboard functionality and associated metrics and charts.

This is a time to flesh out what metrics will be required, how metrics are calculated, and any limitations or assumptions that exist about the data. Stakeholders think through these details and help the BI professional make final project decisions. Then, the BI professional provides stakeholders with a dashboard mockup to get valuable feedback.

Generally, the BI professional will create the document and request review and sign-off from important stakeholders. Then they can begin working on the project with all of the details they need.

Click the link to access the strategy document template, or download the file directly from the attachment below. [Strategy Document template](https://docs.google.com/document/d/13v9_pOAHbcv2dhEMZtPFJ6sgvZaY-9tVp1op32owAdE/template/preview)

[Strategy Document - TEMPLATE](https://d3c33hcgiwev3.cloudfront.net/Ekz_nxIuRRSM_58SLmUUzw_ff3c834c1fcd4f36bb8c0eeca20a96f1_Strategy-Document---TEMPLATE.docx?Expires=1706400000&Signature=eGCHuINHiV87WOmnJqI0i5IxSZ3jrKAQjw1J72OHg7ohmcOCIjeVi9G8HSQN8kAEo7nujXDZijsqZ~aZf-VYbrNF4wqXhFrpfkX5O01EpY5C5R2tOy6qwMx-IsOe1CY~9QuwXQsVj1J3DJSBkMeM9Oj8mOzDoAt8Wf63ahIqWcU_&Key-Pair-Id=APKAJLTNE6QMUY6HBC5A" \t "_blank)

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Staying organized and aligned with stakeholders is an important part of the BI process. Creating documents early on in a project to outline stakeholder and project requirements as well as project strategies can be an important tool for a BI professional aligning with stakeholders and planning ahead. Soon, you’ll have an opportunity to create your own documents to align with stakeholders and plan your end-of-course project!