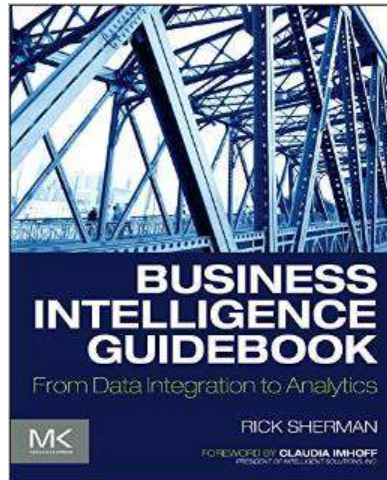# Business Intelligence Guidebook

Templates

Chapter 3:

Business Requirements Template

BI Requirements

Developing the academic system via BI

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EXECUTIVE SUMMARY

Facilitating the academic advisor's process of communicating with students by making the Academy website easier.

Project description

Making the procedure simpler for the academic adviser and the students is our aim.

Goals:

1. To provide a system for academic advisors to easily keep track of the number of students on their list.

2. To sort student accumulative averages in a way that is easy for academic advisors to access and understand.

3. To make notifications visible and easily accessible for both academic advisors and students.

4. To add the feature of sending group messages to facilitate communication between academic advisors and students.

5. To encourage students to enter their information truthfully, communicate efficiently, and use university e-mail for communication purposes.

6. To create a user-friendly website that is easy to navigate for both academic advisors and students

Key Deliverables

- Developing website pages for academic advisors and students.

- Giving students serial numbers for tracking purposes.

- Sorting accumulative averages according to university numbers.

- Adding the feature of sending group messages.

- Making notifications visible for quick response.

Critical Success Factors

- Sort student.

- Students will enter their information truthfully and communicate efficiently.

- University e-mail will be used instead of personal e-mail for communication purposes.

-The website will be user-friendly and easy to navigate for both academic advisors and students.

Risks and Concerns

1. **Budget**
   the cost
   - Actions that affect cost include: Complexity of requirements
   - The ability to reuse pre-existing items
   - Amount of testing and documentation required

   As for the cost within the scope of the project only, there is no actual cost, because due to time constraints and actual lack of resources, there is no real system that will be established. Rather, it is only studies and analyzes, but if we want to speak in detail for a while, the expense will be based first that we will not establish a new system, but rather we will renew the current system Therefore, all existing elements will be renewed with the addition of new elements, and their cost will be relatively much lower than the new creation.

2. **Schedule:**
   If we want to take the time into consideration for the time spent within the scope of the project, then we needed nearly a month and a text to complete all the requirements of the project at all points. The project needed time for discussion and time for implementation, time to test the answers and discuss them with the person responsible for the subject, then re-implementation again, so how would it happen if it was expanded Scope To the scope of implementation of the project at the level of King Khalid University?
   It will need a lot of manpower to represent the time, but thus raise the cost that I mentioned before. It also needs time to renew the infrastructure of the system and then rebuild the interfaces and fill in the data, which will take more than a year from our point of view.

3. **Resources:**
   It is considered the basic building block of any project. For example, the question raised here is where you will get the information and data that will help to list the work or project in a successful and integrated way? Every project has its resources, but what if these sources are difficult to access, what are the alternatives? Is it correct to use alternatives in the absence of the original? All of them are problems that may face any workers on a project, so they must be looked at effectively and seriously before starting anything.
   In the case of our project, our sources were the same academic advisors who opened new doors for us to sources and allowed us to look realistically at what they say as well as to understand the current environment in which they work. As for the other source, it was the students.

4. **Scope:**
   Of course, the scope is a problem of definition in itself, and it must be solved from the beginning, because when studying and analyzing, and after extensive research, we discovered that many of the projects that failed were one of the reasons for their failure is the inability to understand the scope of the project or the failure to compare the scope of the project with time and cost. Projects The scope included nearly a university with all its departments and facilities, but the time required compared to it is not enough to complete only one section. Here lies the problem and the danger. The scope is one of the most important things that must be carefully defined. For our project, and because of time constraints and the lack of sufficient budget, the scope will be only the completion of the expected research. Deliver it at a specified time, so even the implementations that we can mention are within the time range of our project only.

5. **Risk**
   Each project must establish correct basics to avoid possible risks, whether the scope of the project is small like our project or a large scale that includes an entire department or even an entire university. Procedures must be defined
   Avoiding risks before starting is a priority that must be considered, as an example we have:
   - Avoiding the risk of exceeding the delivery time, as this may be considered a defect in the complete system and not being there on time, and this is considered the biggest risk for any project.
   - The seriousness of the shortage in the project. If the project was ready on time, but with incomplete information from the ground up, then this is considered a major problem that requires the implementation of a comprehensive plan to avoid it.
   - Establishing rules from the ground up, and upon implementation, discovering that these rules are impossible to implement here is also considered a risk that may befall the project or lead to its failure, so it must also be avoided.

   One of the most famous ways to deal with the risks surrounding the project:
   - Avoid taking risks.
   - Transfer the risk to a third party to deal with it more effectively.
   - Minimize the risk.
   - Acceptance of risk and not doing something irresponsible may lead to increased losses.

BUSINESS REQUIREMENTS

Table 1: List of Business Requirements

Identifier	Name	Description	Priority
1	High-level	express the objectives and desired outcomes of an organization.	1
2	processes supported	supported by ERP software	2
3	rules and metrics	supply the criteria and conditions for making the decisions for specific action that relates to how the business operates.	3

High-level business requirements:

- We first determined the objectives of the project, then we collected the required data by conducting interviews with academic advisors and some of the struggling students to find out the problems they face on the Academy page, and after limiting and analyzing the problems, we came up with possible solutions in order to improve the communication process between them and improve the site at the same time.

Business processes supported:

- Project management
- Budgeting
- Business process improvement
- Clint onboarding
- Managing accounts

- Data sources

  The source of our data is King Khalid University, the academic advisor.

- Business and data transformations

  Will use data transformation by taking raw source data of students and using SQL and Python to clean, join, aggregate, and implement business logic to create important datasets of students.

- Business metrics or Key Performance Indicators (KPIs)

1.How many students get academic advisory during the whole academic year and per trimester?

2.The level of student satisfaction towards the services that the committee provides per trimester.?

3.How many students whose GPA is less than 2.5 are Followed up during the whole academic year and per trimester?

- Business processes

1. Collection of Information: The first step of the business process is to collect information from the academic advisors regarding the current state of the academic website and the requirements of the students.

2. Analysis of the Requirements: The collected information will be analyzed to identify the common requirements of the students and the areas that need improvement on the academic website.

3. Development of the Improvement Plan: Based on the analysis, a plan will be developed to improve the academic website to facilitate communication between the advisor and the student. This plan will include a list of requirements that will be added or modified on the website.

4. Implementation of the Plan: The new features and modifications will be implemented on the academic website. The IT department will be responsible for deploying the changes to the website and ensuring its functionality.

5. Testing and Feedback: Once the new features are deployed, testing will be done to check the website's stability and functionality. Also, feedback will be collected from advisors and students on the website improvements to identify the areas that still need to be enhanced.

6. Ongoing Maintenance: After the website's release, ongoing maintenance and support will be provided to keep the website up-to-date and resolve any issues that arise. The IT department will be responsible for maintaining the website's stability and ensuring that both the advisor and student have a better user experience

- **List business groups involved and describe type of involvement**

  King Khalid University
  Academic advisors
  Some students of the Faculty of Computer Science

- **List business owner(s)**

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- **List subject matter expert(s)**

  Ms. .Mona Moshbab

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DATA AND DATA QUALITY REQUIREMENTS

Data sources

We need students data and some of the academic advisor's data and the source of all this data is preexisting source.

Data cleansing

The data now does not need the cleaning process, but perhaps in the future we will need to preprocess and clean it before starting the site development operations

Master Data Management (MDM)

The Academia website contains important student data, and this data is usually shared across the university. It is also relied upon in decision-making processes for the student, and the data management system collects, organizes, protects, and stores all student and counselor data. Also, the main data management objectives include organizing, centralizing, and updating only the main data.

Data acquisition

We need to use a dataset that contains columns and row for students data, these are the columns(Student number, student name, previous range, current range, GPA, number of hours passed, number of student warnings, communication requests.

FUNCTIONAL REQUIREMENTS

BI use cases

As part of the improvements to the academic advising system, we have added a serial number to the table to count the number of students for each mentor , and we added the selection option to allow the mentor to select the desired students to communicate with and send a unified message to communicate with them. We will add to it to arrange the students from the weak level to the highest in ascending order. In the dashboard page, an alert has been added for both the student and the mentor to notify them that there is a request for communication.
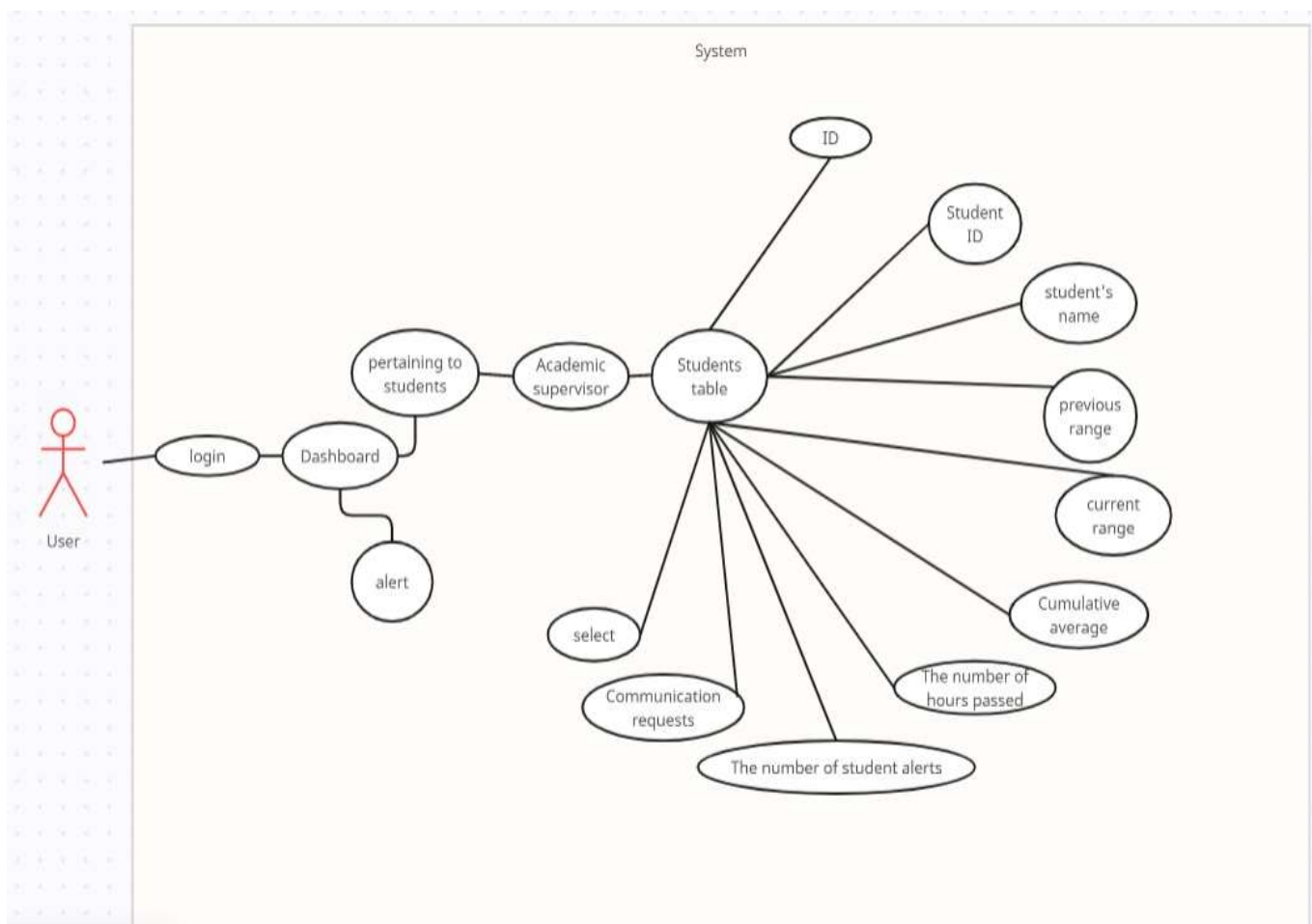
REGULATORY/COMPLIANCE REQUIREMENTS

University rights for students: Each male or female student at the university has a number of rights and services provided by the university, including a group of academic and non-academic rights, and the university must take the necessary measures to provide and achieve them. We have listed some of the rights that are compatible with our project:

1- Academic rights:

 The university must provide students with the following:

1. Appropriate guidelines through which they learn about their rights and duties, study and examination regulations, discipline, and grievance controls through all available means at the university, such as
books, brochures, or electronic links via the university's electronic portal, in addition to seminars and introductory meetings.
2. Guidance programs to familiarize students with the university's systems, facilities, and services, especially for newcomers.
3.An effective system for guiding students in university faculties, guiding them academically, and cooperating with them in solving problems that they may encounter in an appropriate manner.
4.Preserving the contents of students' files within the university, and the confidentiality of the information provided therein, and not handing over any of them except to the student himself, or to whomever he
officially authorizes, except for cases in which the contents of that file are requested to be handed over or viewed by the academic advising units at the university or the investigation authorities. Official or
judicial bodies according to explicit official correspondence.

2- Non-academic rights:

The university must provide students with the following:

1. Dealing with them with respect by the academic and administrative bodies of the university, and providing them with psychological security in all their dealings.
2. Benefit from the university's services and facilities, university books, university housing, central and branch libraries, databases, internet services, sports stadiums, restaurants, parking lots for students,
and others, in accordance with the regulations and systems in force at the university.
Second: Duties of male and female students at King Khalid University
In order for all students to obtain their academic and non-academic rights, they must adhere to a set of duties that lead to providing a distinguished academic environment.

The duties that every student must abide by and be fully responsible for are the following:

1- Academic duties:

1. Abide by the university's regulations, bylaws, instructions, and decisions issued for their implementation, and not violate or circumvent them.

2. Students' commitment to the instructions for arranging, organizing, and using the university's facilities and equipment for the purposes designated for them, and obtaining prior permission from the

competent authority to use these facilities or equipment when they want to use them.

3. Strive to acquire knowledge and sciences, self-learning, increase the cultural balance of knowledge sources inside and outside the university, and scientific and cultural communication through new and

diverse science windows.

4. Participation and positive interaction in the success of the academic activities and programs organized by the university.

TECHNICAL REQUIREMENTS

The project is considered possible with current technology because it provides the possible technical requirements of hardware and software for the work of the site, and it is fully technically based and will make it easier for both academic advisors and students. Languages that developers can use to improve the page: HTML, CSS, PHP, Java and JavaScript.

REQUIREMENTS CROSS-MATRIX

produced prior to the test execution process to ensure that all requirements are addressed in the form of a Test case, ensuring that no testing is missed.

	Requirements	Academic Advisors	Students
1	Keep track of number of students on list	Required	N/A
2	Sort accumulative averages	Required	N/A
3	Accessible notifications	Required	Required
4	Group messaging feature	Required	Required
5	Encourage truthful information and efficient communication	Required	Required
6	Use university e-mail for communication purposes	Required	Required
7	User-friendly website navigation	Required	Required
8	Serial numbers for tracking purposes	N/A	Required

PRIORITIZING REQUIREMENTS

Requirement priorities Subjective priority of requirements based on sponsor and users preferences:

1. **Database:**
   - It is considered one of the importance and priorities of the project because it in itself is considered the basic infrastructure on which the entire work will be based. If the idea of the project is renewal, not construction, here we will need databases to see the elements and information available in them, and then determine what they require of renewal and additions.

2. **Excel worksheet:**
   - Some departments are fully functional in the excel system and worksheet, which usually includes thousands of files and papers that the project will need to carry out its task, which is to renew the project. Therefore, these papers must be studied and analyzed and see what will be needed from them or the ability to convert them in the new system into a more technical one. Evolution serve both parties in a more effective manner.

3. **Dashboard:**
   - The importance of any project that is currently based on the dashboard that is expected to be included, and to include the dashboard, you must first explore the existing dashboard, understand each field in it, the reason for its existence, the way it works, and the benefit of it in the current system, to know what will be renewed and what will be kept of the elements it contains.

4. **Interviews with sponsors and users:**
   - Interviews or the process of asking questions and taking answers was and still is one of the most effective ways to determine your priorities, directions, and procedures as well in any project you plan to start working on, as the answers or statistical data that you will get directly from those you expect to use the new system is what will help develop a system More effective and usable.

5. **Methodology:**
   - The work team must develop a clear and sequential plan of action based on a specific method and approach that includes clear steps and direct goals for work and for reference every time it becomes so. Such a step will put the implementation team under a sequential schedule that must be restricted to avoid any problems that may occur.

What will be obtained after the implementation of all of the above, from a study and analysis of the old system and its worksheet, to access to the databases and all the mentioned points, and to develop the appropriate plan or approach that the project will follow here. They reached points that enable them to divide the time and determine the costs more clearly.

Such classifications are:

- Mandatory (must have)
- Desirable (Should have nice to have)
- Optional (Forget about nice to have)

It will also give the project workers the ability to choose the technologies, programs and devices required to implement this project to the fullest extent, and what are their available alternatives in case of error or malfunction.

APPROVALS

Before	After
If the mentor sends an e-mail to the student, he will not receive a notification, and sometimes he will receive a spam status, as if it is a fake e-mail.	The Communication Through Academy box will provide notifications to the student and the advisor.
There is no regular way for the student to communicate with the advisor except via email. If the student sends an email, clear information will appear in the guide.	We can set up a user interface or field in an academy directly in which the student communicates with his name, number, and specialization. With an academic advisor
The mentor does not have a specific order for the students. I mean, there are no ratings. Their average group is under 2.Their average group reached 1.5.A group of students who send emails complaining	The mentor can group the students into groups and send them one general message. The mentor can classify the students according to the average, and the mentor can also classify the students according to their specialization.
There is no clear clarification by academics of the mentor's name, as the student is ignorant of how to communicate with his mentor or even the location of his office.	There is a field in which the guide is indicated. its name his email His office hours The location of the office is right (in any building, any floor, any office number).
The students and the guide do not have any meetings except when necessary. The counselor does not have any information about the student or any tracking of the student, his grades, or his status.	There shall be one guide for the student in his university career, and there shall be a box in which he shall review the student's status, requests, and average from the time he enters the university until graduation.
The student does not have a specific way to send it to the mentor as a guide.(The mentor is a doctor responsible for the students, and he receives emails from the students of the course and also from the students whose mentor he is.)The guide receives emails from everyone, so he may not read the email of a student who needs him as a guide.	It is in a specific form, questionnaire, or form that the student fills in and presses end. "And it is connected directly to the mentor, so it is clear that this student is his academic mentor and he needs help, not the subject doctor.

The counselor does not have a specific index for the students showing the number of students he is mentoring or the number of students whose grades are low.	It has a specific index for its own database that shows the number of students who are mentors and their order by ID. And they are classified by colors on the basis of, for example, a high rate that needs developmental advice (green color).Average rate needs follow-up orange color Low rate needs close follow-up; red color
Only at the beginning of the first year is a welcoming and educational ceremony held for students. Most of the students do not know about it and do not attend.	At the beginning of each year, a meeting takes place. To remind students and make them aware of all matters that concern them.

APPENDIX: INPUTS FOR REQUIREMENTS

Interviewees

When we asked the students whose GPA was less than 2 why their level was low, there were numerous reasons given

-inadequate command of the English language

-Lack of understanding of university policies, as well as the status and distribution of grades, caused several courses to be missed.

 -not taking a representative course on university regulations and costs

 -No one has been in touch with us about the absence

 -The role of your mentor was nonexistent

In addition, we asked some of the mentors about being a mentors academy and what difficulties they faced

-The method of communication is tiring, and they do not know if there is communication from the student

-Not checking with the student's number and email

-No serial numbers

-Not sorting the order of modifiers

-The students communicate, there are no notices, and they are not content with a schedule with Al-Ahmar

Data sources examined

std name	std ID	std email	std dapt
noor	4.4E+08	43980676	CS
reem	4.37E+08	43667656	CS
asma	4.4E+08	43966756	CS
Lama	4.38E+08	43766356	IS
razan	4.4E+08	43980365	IS
saja	4.4E+08	43980356	CS
rahaf	4.5E+08	44960356	IS
raneem	4.4E+08	43980659	IS
maha	4.4E+08	43980567	IS
sara	4.4E+08	43986786	IS

Worksheets have some disadvantages, including:

1_ Limited interactivity: Worksheets are static documents that provide limited interactivity. Once the worksheet is printed or saved, it cannot be easily modified or updated.

2_ Limited collaboration: Worksheets can be difficult to collaborate on, particularly if multiple people must make changes simultaneously. This can make it difficult to work on group projects or get peer feedback.

3 _Limited multimedia support: Worksheets typically do not support multimedia elements such as videos, audio files, or interactive graphics. This can limit the ability to create engaging and interactive content.

4 _Limited accessibility: Worksheets may not be accessible to all users, particularly those with visual impairments. This can make it difficult for some students to access the content and complete the assignments.

5 _Over-reliance on rote learning: Worksheets can encourage rote learning and memorization of facts, rather than deeper understanding and critical thinking.

6 _Time-consuming: Creating worksheets can be time-consuming, particularly if the content needs to be updated frequently. This can be a burden on teachers, who may need to spend a significant.

Data source systems documentation

 -Do you get notifications for students whose level is low? No

- Did you contact the students with low-level noises to alert them? No

-What do you think about the existence of an external document that contains the number of students who failed? Yes

-Are the students made aware of their low level? No it didn't

-Would it be useful to arrange students from lowest to highest according to their grades? Yes

-Does the counselor's communication with the students contribute to improving the students' rate? Yes

There is difficulty in communicating with the students because of the large number of students, and the advisor's failure to alert students who have defaulted, and the absence of a serial number that facilitates communication with the students. He created a serial list for the students who failed, and sent a message to the students of the need to communicate with the advisor by attaching the advisor's email, which helps in easy communication between them..

Project questions:

Razan answers:

-In which academic year did the GPA decrease by a large percentage?

In 2020 the first academic year.

What was your GPA?

2.60

-What are the reasons for the decline in GPA?

Lack of proficiency in the English language. Also, a lack of knowledge of university laws and the distribution of grades led to absenteeism.

-In the event of a significant decrease in the GPA, will the student be able to raise it in the coming years?

Yes, my GPA was raised by a huge difference when I developed myself more in learning the English language.

-Has anyone from the university contacted you about your GPA?

No communication, unfortunately.

-What was the role of your mentor? Did you have any contact?

No, they didn't have a role.

-Do counselors' intervention and guidance to the student change the situation from your point of view?

Yes, because they will make the student aware of things that she may not be aware of at first.

-Did you realize the problem and dealt with it from the beginning? If yes, how? And if not, tell us what your behavior was at that time.

Yes, I tried to develop my language and understand the specialty more.

-In your opinion, what factors should be available in the university to help the student improve her academic status?

- Appointing an educational staff specialized in assisting new students to avoid this problem.
- Providing an English course before entering the specialization to help students enter the major with at least good basics.

Reporting systems, reports and data shadow systems examined

Data shadow systems (sometimes called Spreadmarts) are administrative systems that are frequently seen (usually spreadsheets), which are often represented by the spreadsheet of the Excel program, and they are so far used in many systems and institutions, including the academic advising department at our university

After extensive interviews with the mentors, we concluded that the current system needs to introduce business intelligence techniques and tools. It may be difficult, and it may require reverse engineering of misleading data systems.

 Reports are still used in Excel in academic advising, which leads to a malfunction in the system and loss of information, and this is due to the lack of use of technology, and the result is failure to meet the expectations of the department

The reporting system must be suitable for the employers, and there are two ways to build the report effectively

The first source is open source like Python

And the other is to use reporting tools such as Crystal Report and Find Report. These two methods are more effective than the old method using Excel.

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