BUSINESS INTELLIGENCE SYSTEMS

CS591 Course Project

Team 03

Prasanthi Putta

TABLE OF CONTENTS
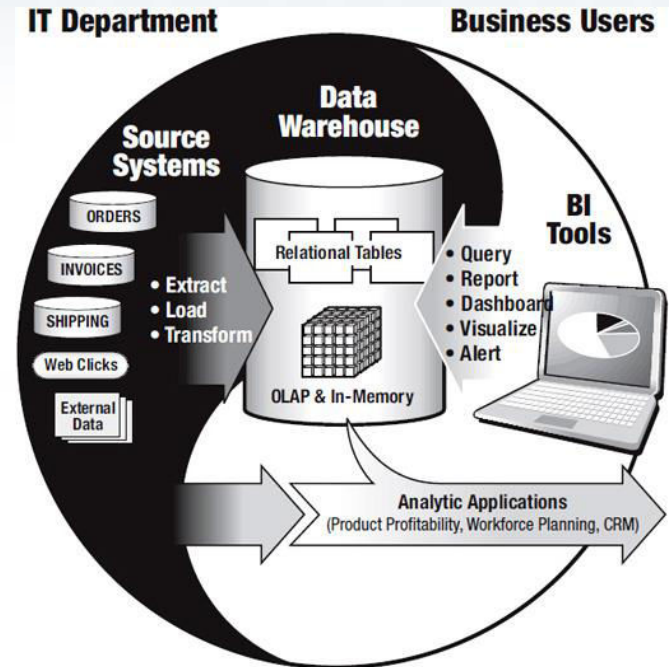
INTRODUCTION TO BI SYSTEMS

- Business intelligence (BI) is a set of technologies and processes that allow people at all levels of an organization to access and analyze data.
- Business performance is measured by several financial indicators, such as revenue, margin, profitability, cost to serve, and so on.

A key sign of successful business intelligence is the degree to which it impacts business performance, linking insight to action.

https://learning.oreilly.com/library/view/successful-business-intelligence/9780071809184/

BI Tool	JasperReports	Pentaho	BIRT	Apache Superset	Redash
Scope	JasperReports Server offers web-based reporting, analytic tools and visualization, and a dashboard feature for compiling multiple custom views.	The scope of the Pentaho BI suite is vast supporting all kinds of data and data sources that furnish limitless visualization options.	The BIRT Project will focus on leveraging the Eclipse platform to provide infrastructure and tools for the designing, deploying, generating and viewing of reports in an organization, including ad hoc query and reporting tools.	Superset is a data exploration platform designed to be visual, intuitive and interactive. It's main goal is to make it easy to slice, dice and visualize data.	Redash helps users connect and query data sources, visualize data, build dashboards, and share insights with the rest of their organization.
Main Functions	▪ Flexible, Modern, and Embeddable Server Architecture ▪ Centralized Reporting, Dashboards, and Data Analytics ▪ Secured Data Access and Auditing ▪ Ad Hoc Report and Dashboard Development ▪ OLAP Analysis	▪ High-end data analysis through well-defined ETL capabilities ▪ Expertise in products across varied domains ▪ Comprehensive report designer taking care of business needs ▪ Exceptional data source accommodability with high runtime metadata support	▪ Build reports on XML data sources ▪ Used to build reusable component report libraries ▪ Allows run time modification of Data Source and Data Set public properties	▪ A lightweight semantic layer, allowing to control how data sources are exposed to the user by defining dimensions and metrics ▪ Configurable caching options for loading dashboards ▪ Maps and geo support leveraging Mapbox ▪ User profile pages which highlight a user's favorite dashboards/slices.	▪ Quick editor ▪ Combine several visualizations ▪ Collaboration ▪ Alerts ▪ Query
Programming languages	JAVA, XML, JavaScript	JAVA, XML, XSL Transformation, JavaScript, HTML	JAVA, XML, HTML, CSS	Python, JavaScript, Typescript, HTML	Python, JavaScript, CSS, HTML
Lines of Code	529,644	793,870	2,362,446	71,751	40,364
Technical Platform	▪ OS:Windows, Linux, Mac OS, iOS, Android ▪ Application Servers: Apache Tomcat, JBoss, WildFly ▪ Database Repositories: MySQL	▪ OS:Windows, Ubuntu ▪ Application Servers:Apache Tomcat, JBoss ▪ Database Repositories: MySQL, Oracle, PostgreSQL, MS SQL	▪ OS:Windows, Linux ▪ Application Servers:Apache Tomcat, IBM WebSphere, JBoss, WildFly ▪ Database Repositories: MySQL, Oracle, PostgreSQL, MS SQL, IBM DB2	▪ OS:Windows, Ubuntu, Mac OS ▪ Application Servers: Gunicorn, Nginx, Apache ▪ Database Repositories: Amazon Redshift, Apache Hive, Teradata, MySQL, Oracle, PostgreSQL, MS SQL, IBM DB2	▪ OS:Windows, Linux ▪ Database Repositories: PostgreSQL, MySQL, Redshift, MongoDB
Trail Version Website	https://community.jaspersoft.com/download	http://www.pentaho.com/download	https://download.eclipse.org/birt/downloads/	https://superset.apache.org/installation.html	https://redash.io/help/open-source/setup

Proposing – Incremental Model

Justification:

- Most of the requirements are known up-front but are expected to evolve over time.
- Each release delivers an operational product and Initial product delivery is faster.
- Customer can respond to every build.
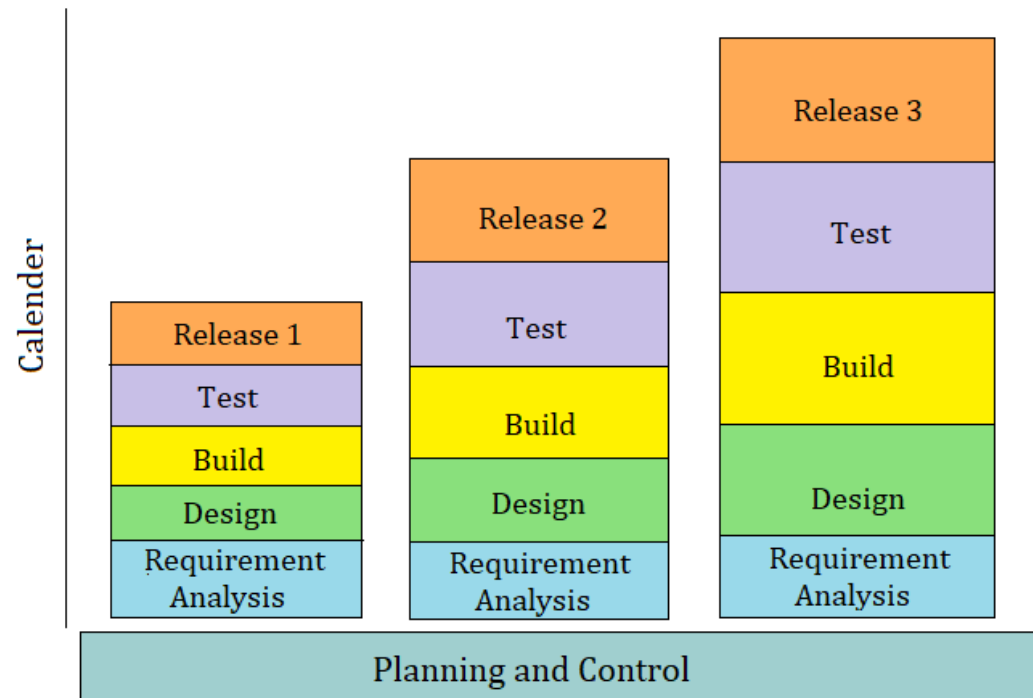
- BI is all about how to capture, access, understand, analyze and turn one of the most valuable assets of an enterprise –raw data– into actionable information in order to improve business performance.
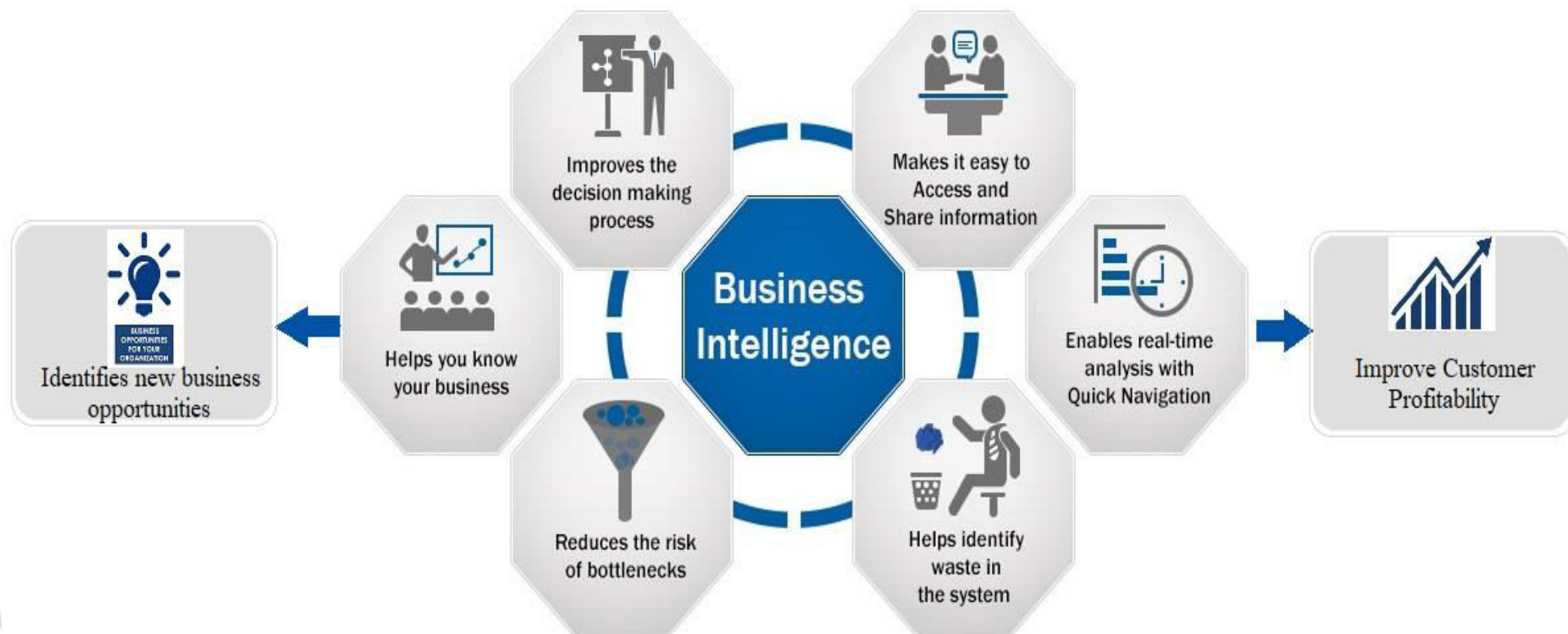
- Functional Requirements:
    - Platform Functions
    - Data Visualization
    - Analytics
    - Online Analytical Processing (OLAP)
    - Document Management
    - Decision Services
    - Integrations
    - Big Data Integration
    - Deployment

- Non-Functional Requirements:
  - Performance
  - Security
  - Availability
  - Usability
  - Data Integrity
  - Scalability

- Constraints on Technical Platform:
  - Operation Systems: Windows, Linux
  - Application Server: Apache
  - Database Repositories: Microsoft SQL Server, Oracle
  - Programming Languages: Python, JavaScript, HTML, CSS

- Work Breakdown Structure (WBS)

#	WBS	Task	Task Name
1	1		⊿ **SPM_Project_BusinessIntelligence**
2	1.1		⊿ **Project Initiation**
3	1.1.1		Develop project charter
4	1.1.2		Develop Statement Of Work
5	1.1.3		Develop preliminary scope development
6	1.1.4		Develop preliminary architectural model
7	1.1.5		Project initiation complete
8	1.2		⊿ **Project plan**
9	1.2.1		Develop scope management plan
10	1.2.2		Develop change management plan
11	1.2.3		Develop initial descriptive budget
12	1.2.4		Develop schedule
13	1.2.5		Develop quality management plan
14	1.2.6		Develop human resource plan
15	1.2.7		Develop risk management plan
16	1.2.8		Project plan complete
17	1.3		⊿ **Project Execution**
18	1.3.1		⊿ **Release 1**
19	1.3.1.1		Analysis phase
20	1.3.1.2		Design phase
21	1.3.1.3		Construction phase
22	1.3.1.4		Validation phase
23	1.3.1.5		Deployment phase
24	1.3.1.6		Closeout
25	1.3.1.7		Release 1 Complete

#	WBS	Task	Task Name
26	1.3.2		⊿ **Release 2**
27	1.3.2.1		Analysis phase
28	1.3.2.2		Design phase
29	1.3.2.3		Construction phase
30	1.3.2.4		Validation phase
31	1.3.2.5		Deployment phase
32	1.3.2.6		Closeout
33	1.3.2.7		Release 2 Complete
34	1.3.3		⊿ **Release 3**
35	1.3.3.1		Analysis phase
36	1.3.3.2		Design phase
37	1.3.3.3		Construction phase
38	1.3.3.4		Validation phase
39	1.3.3.5		Deployment phase
40	1.3.3.6		Closeout
41	1.3.3.7		Release 3 Complete
42	1.3.4		⊿ **Release 4**
43	1.3.4.1		Analysis phase
44	1.3.4.2		Design phase
45	1.3.4.3		Construction phase
46	1.3.4.4		Validation phase
47	1.3.4.5		Deployment phase
48	1.3.4.6		Closeout
49	1.3.4.7		Release 4 Complete
50	1.3.5		**Execution complete**
51	1.4		**Project Closeout**
52	1.5		**Project Complete**

- Roles and Responsibility Matrix (RRM)

WBS	Project Manager1	Project Manager2	Senior Architect	Technical Lead	Quality Assurance Lead	Business Intelligence Analyst	System Analyst1	System Analyst2	Developer 1	Developer 2	Developer 3	Developer 4	Developer 5	Developer 6	Developer 7	Developer 8	Tester1	Tester2
1.1.1	R	I																
1.1.2	R	I	C															
1.1.3	R	I	C			C												
1.1.4		I	R	C			C											
1.1.5	R	I																
1.2.1	R	I				C												
1.2.2	A	R	I	C		C												
1.2.3	R	I																
1.2.4	A	R	I	C		C												
1.2.5		A	I	C	R	C	C	C										
1.2.6		A	I	R	C		C	C										
1.2.7	A	I	R				C	C										
1.2.8	R	I	C															
1.3.1.1		A	C	C		R	R	I										
1.3.1.2		A	R	R	R	C	I	I										
1.3.1.3		A		C			I	I	R	R	R	R	R	R	R	R		
1.3.1.4				A	C	I											R	R
1.3.1.5		A	I	C					R	I								
1.3.1.6		A	R	I														
1.3.1.7	R	R	I	I		C												
1.3.2.1		A	C	C		R	R	I										
1.3.2.2		A	R	R	R	C	I											
1.3.2.3		A		C			I	I	R	R	R	R	R	R	R	R		
1.3.2.4				A	C	I											R	R
1.3.2.5		A	I	C					I	R								
1.3.2.6		A	R	I														
1.3.2.7	R	R	I	I		C												

R – Responsible   A – Approval   C – Consult/Review   I – Inform or Act as SME

- Roles and Responsibility Matrix (cont..)

WBS	Project Manager1	Project Manager2	Senior Architect	Technical Lead	Quality Assurance Lead	Business Intelligence Analyst	System Analyst1	System Analyst2	Developer 1	Developer 2	Developer 3	Developer 4	Developer 5	Developer6	Developer7	Developer 8	Tester1	Tester2
1.3.3.1		A	C	C		R	R	I										
1.3.3.2		A	R	R	R	C	I	I										
1.3.3.3			A	C			I	I	R	R	R	R	R	R	R	R		
1.3.3.4				A	C	I											R	R
1.3.3.5		A	I	C					R	I								
1.3.3.6		A	R	I														
1.3.3.7	R	R	I	I		C												
1.3.4.1		A	C	C		R	R	I										
1.3.4.2		A	R	R	R	C	I											
1.3.4.3			A	C			I	I	R	R	R	R	R	R	R	R		
1.3.4.4				A	C	I											R	R
1.3.4.5		A	I	C					I	R								
1.3.4.6		A	R	I														
1.3.4.7	R	R	I	I		C												
1.4	R	R	I	I	I	C	I	I	I	I	I	I	I	I	I	I	I	I
1.5	R	R																

R – Responsible   A – Approval   C – Consult/Review   I – Inform or Act as SME

- List of required resources:

Human Resources	Material Resources
Project Manager1	Laptop1, Cellphone1, PDA1
Project Manager2	Laptop2, Cellphone2, PDA2
Senior Architect	Laptop3, Cellphone3, PDA3
Technical Lead	Laptop4, Cellphone4
Quality Assurance Lead	Laptop5, Cellphone5
Business Intelligence Analyst	Laptop6, Cellphone6
System Analyst1	Laptop7, Cellphone7
System Analyst2	Laptop8, Cellphone 8
Developer1	Laptop9
Developer2	Laptop10
Developer3	Laptop11
Developer4	Desktop1
Developer5	Desktop2
Developer6	Desktop3
Developer7	Desktop4
Developer8	Desktop6
Tester1	Laptop12
Tester2	Desktop5

- List of required resources (cont..):

	Resource Name	Type
1	Project Manager1	Work
2	Project Manager2	Work
3	Senior Architect	Work
4	Technical Lead	Work
5	Quality Assurance Lead	Work
6	Business Intelligence Analyst	Work
7	System Analyst1	Work
8	System Analyst2	Work
9	Developer1	Work
10	Developer2	Work
11	Developer3	Work
12	Developer4	Work
13	Developer5	Work
14	Developer6	Work
15	Developer7	Work
16	Developer8	Work
17	Tester1	Work
18	Tester2	Work
19	PDA1	Material
20	PDA2	Material
21	PDA3	Material
22	Laptop1	Material
23	Laptop2	Material

	Resource Name	Type
24	Laptop3	Material
25	Laptop4	Material
26	Laptop5	Material
27	Laptop6	Material
28	Laptop7	Material
29	Laptop8	Material
30	Laptop9	Material
31	Laptop10	Material
32	Laptop11	Material
33	Laptop12	Material
34	Cellphone1	Material
35	Cellphone2	Material
36	Cellphone3	Material
37	Cellphone4	Material
38	Cellphone5	Material
39	Cellphone6	Material
40	Cellphone7	Material
41	Cellphone8	Material
42	Desktop1	Material
43	Desktop2	Material
44	Desktop3	Material
45	Desktop4	Material
46	Desktop5	Material
47	Desktop6	Material

- Lines of Code Based Estimate:

Function	Pages(P)	Lines of code per Page (LOCP)	Total Lines Of Code (TLOCF)
User Interface for Static Pages	62	81	5022
User Interface for Dynamic Pages	89	154	13706
Code behind for Static Pages	67	95	6365
Code behind Dynamic Pages	98	162	15876
Data Base –SQL Stored Procedures	64	144	9216
Business layer- Logical Pages	86	125	10750
Other Layer-Logical Pages	75	120	9000
Total(TLOC):			69,935
Total Project Cost(TPC) in $:			1,118,960

Estimating $16 per line of code
Total Project Cost = 69,935 * 16 = $1,118,960

- Function Point Based Estimate:

Complexity Calculation							
Category	Low	Weight_L	Average	Weight_A	High	Weight_H	Total (T)
User inputs	27	4	14	6	7	3	250
User outputs	25	4	12	5	6	4	210
User inquires	23	2	11	6	5	5	219
File/Structures	26	8	12	9	5	7	396
External Interface	18	7	9	9	4	7	242
						Unadjusted Total (UT):	1120

Total Functional points = 1120

Average Cost per functional point is 1000

Estimated Project Cost = 1120* 1000 = $1,120,000

- List of all project tasks with predecessors and durations:

	WBS		Task Mode	Task Name	Duration	Start	Finish	Predecessors
1	1			⊿ SPM_Project_BusinessIntelligence	571 days	Mon 6/1/20	Mon 8/8/22	
2	1.1			⊿ Project Initiation	87 days	Mon 6/1/20	Tue 9/29/20	
3	1.1.1			Develop project charter	21 days	Mon 6/1/20	Mon 6/29/20	
4	1.1.2			Develop Statement Of Work	24 days	Tue 6/30/20	Fri 7/31/20	3
5	1.1.3			Develop preliminary scope developmen	20 days	Mon 8/3/20	Fri 8/28/20	3,4
6	1.1.4			Develop preliminary architectural mode	22 days	Mon 8/31/20	Tue 9/29/20	3,4,5
7	1.1.5			Project initiation complete	0 days	Tue 9/29/20	Tue 9/29/20	3,4,5,6
8	1.2			⊿ Project plan	135 days	Wed 9/30/20	Tue 4/6/21	
9	1.2.1			Develop scope management plan	17 days	Wed 9/30/20	Thu 10/22/20	2
10	1.2.2			Develop change management plan	44 days	Fri 10/23/20	Wed 12/23/20	9
11	1.2.3			Develop initial descriptive budget	45 days	Thu 12/24/20	Wed 2/24/21	9,10
12	1.2.4			Develop schedule	28 days	Thu 2/25/21	Mon 4/5/21	10,11
13	1.2.5			Develop quality management plan	37 days	Wed 9/30/20	Thu 11/19/20	2
14	1.2.6			Develop human resource plan	18 days	Thu 12/24/20	Mon 1/18/21	10,13
15	1.2.7			Develop risk management plan	33 days	Tue 1/19/21	Thu 3/4/21	10,14
16	1.2.8			Project plan complete	1 day	Tue 4/6/21	Tue 4/6/21	9,10,11,12,13,14,15
17	1.3			⊿ Project Execution	348 days	Wed 4/7/21	Fri 8/5/22	
18	1.3.1			⊿ Release 1	109 days	Wed 4/7/21	Mon 9/6/21	
19	1.3.1.1			Analysis phase	28 days	Wed 4/7/21	Fri 5/14/21	8
20	1.3.1.2			Design phase	28 days	Mon 5/17/21	Wed 6/23/21	19
21	1.3.1.3			Construction phase	25 days	Thu 6/24/21	Wed 7/28/21	20
22	1.3.1.4			Validation phase	15 days	Thu 7/29/21	Wed 8/18/21	21
23	1.3.1.5			Deployment phase	10 days	Thu 8/19/21	Wed 9/1/21	22
24	1.3.1.6			Closeout	3 days	Thu 9/2/21	Mon 9/6/21	23
25	1.3.1.7			Release 1 Complete	0 days	Mon 9/6/21	Mon 9/6/21	24
26	1.3.2			⊿ Release 2	94 days	Tue 9/7/21	Fri 1/14/22	

- List of all project tasks with predecessors and durations (cont..):

	WBS	Task Mode	Task Name	Duration	Start	Finish	Predecessors
27	1.3.2.1		Analysis phase	26 days	Tue 9/7/21	Tue 10/12/21	18
28	1.3.2.2		Design phase	26 days	Wed 10/13/21	Wed 11/17/21	27
29	1.3.2.3		Construction phase	23 days	Thu 11/18/21	Mon 12/20/21	28
30	1.3.2.4		Validation phase	12 days	Tue 12/21/21	Wed 1/5/22	29
31	1.3.2.5		Deployment phase	5 days	Thu 1/6/22	Wed 1/12/22	30
32	1.3.2.6		Closeout	2 days	Thu 1/13/22	Fri 1/14/22	31
33	1.3.2.7		Release 2 Complete	0 days	Fri 1/14/22	Fri 1/14/22	32
34	1.3.3		◢ Release 3	79 days	Mon 1/17/22	Thu 5/5/22	
35	1.3.3.1		Analysis phase	22 days	Mon 1/17/22	Tue 2/15/22	26
36	1.3.3.2		Design phase	22 days	Wed 2/16/22	Thu 3/17/22	35
37	1.3.3.3		Construction phase	20 days	Fri 3/18/22	Thu 4/14/22	36
38	1.3.3.4		Validation phase	10 days	Fri 4/15/22	Thu 4/28/22	37
39	1.3.3.5		Deployment phase	4 days	Fri 4/29/22	Wed 5/4/22	38
40	1.3.3.6		Closeout	1 day	Thu 5/5/22	Thu 5/5/22	39
41	1.3.3.7		Release 3 Complete	0 days	Thu 5/5/22	Thu 5/5/22	40
42	1.3.4		◢ Release 4	66 days	Fri 5/6/22	Fri 8/5/22	
43	1.3.4.1		Analysis phase	18 days	Fri 5/6/22	Tue 5/31/22	34
44	1.3.4.2		Design phase	18 days	Wed 6/1/22	Fri 6/24/22	43
45	1.3.4.3		Construction phase	15 days	Mon 6/27/22	Fri 7/15/22	44
46	1.3.4.4		Validation phase	10 days	Mon 7/18/22	Fri 7/29/22	45
47	1.3.4.5		Deployment phase	4 days	Mon 8/1/22	Thu 8/4/22	46
48	1.3.4.6		Closeout	1 day	Fri 8/5/22	Fri 8/5/22	47
49	1.3.4.7		Release 4 Complete	0 days	Fri 8/5/22	Fri 8/5/22	48
50	1.3.5		Execution complete	0 days	Fri 8/5/22	Fri 8/5/22	18,26,34,42
51	1.4		Project Closeout	1 day	Mon 8/8/22	Mon 8/8/22	17
52	1.5		Project Complete	0 days	Mon 8/8/22	Mon 8/8/22	51

- Gantt Chart View with Critical Path:

TIME MANAGEMENT PLAN (cont..)

- Gantt Chart View with Critical Path (cont..):

- **Total Project Time:**

Phases	Start Date	Final Date	Duration(Days)
1.1 Project Initiation	06/01/2020	09/29/2020	87
1.2 Project Plan	09/30/2020	04/06/2021	135
1.3.1 Release 1	04/07/2021	09/06/2021	109
1.3.2 Release 2	09/07/2021	01/14/2022	94
1.3.3 Release 3	01/17/2022	05/05/2022	79
1.3.4 Release 4	05/06/2022	08/05/2022	66
Overall Project	06/01/2020	08/08/2022	571

Total Project time = 571 days

- List of human resources with salaries:

ℹ	Resource Name	Type	Initials	Max.	Std. Rate
1	Project Manager1	Work	P	100%	$72.73/hr
2	Project Manager2	Work	P	100%	$68.18/hr
3	Senior Architect	Work	S	100%	$63.64/hr
4	Technical Lead	Work	T	100%	$59.09/hr
5	Quality Assurance Lead	Work	Q	100%	$50.00/hr
6	Business Intelligence Analyst	Work	B	100%	$50.00/hr
7	System Analyst1	Work	S	100%	$54.55/hr
8	System Analyst2	Work	S	100%	$50.00/hr
9	Developer1	Work	D	100%	$56.82/hr
10	Developer2	Work	D	100%	$54.55/hr
11	Developer3	Work	D	100%	$50.00/hr
12	Developer4	Work	D	100%	$45.45/hr
13	Developer5	Work	D	100%	$45.45/hr
14	Developer6	Work	D	100%	$40.91/hr
15	Developer7	Work	D	100%	$40.91/hr
16	Developer8	Work	D	100%	$40.91/hr
17	Tester1	Work	T	100%	$43.18/hr
18	Tester2	Work	T	100%	$38.64/hr

- List of material resources with costs:

		Resource Name	Type	Initials	Std. Rate
19		PDA1	Material	P	$500.00
20		PDA2	Material	P	$500.00
21		PDA3	Material	P	$500.00
22		Laptop1	Material	L	$2,000.00
23		Laptop2	Material	L	$2,000.00
24		Laptop3	Material	L	$2,000.00
25		Laptop4	Material	L	$1,600.00
26		Laptop5	Material	L	$1,600.00
27		Laptop6	Material	L	$1,600.00
28		Laptop7	Material	L	$1,600.00
29		Laptop8	Material	L	$1,600.00
30		Laptop9	Material	L	$1,500.00
31		Laptop10	Material	L	$1,500.00
32		Laptop11	Material	L	$1,500.00
33		Laptop12	Material	L	$1,500.00
34		Cellphone1	Material	C	$1,000.00
35		Cellphone2	Material	C	$1,000.00
36		Cellphone3	Material	C	$800.00
37		Cellphone4	Material	C	$800.00
38		Cellphone5	Material	C	$800.00
39		Cellphone6	Material	C	$800.00
40		Cellphone7	Material	C	$800.00
41		Cellphone8	Material	C	$800.00
42		Desktop1	Material	D	$1,200.00
43		Desktop2	Material	D	$1,200.00
44		Desktop3	Material	D	$1,200.00
45		Desktop4	Material	D	$1,200.00
46		Desktop5	Material	D	$1,200.00
47		Desktop6	Material	D	$1,200.00

- Project Budget:

Phases	Total Project Cost ($)	Actual Cost ($)	Remaining Cost ($)
1.1 Project Initiation	$100,355.28	$100,355.28	$0.00
1.2 Project Plan	$225,865.04	$225,865.04	$0.00
1.3.1 Release 1	$232,265.44	$29124.09	$203,141.35
1.3.2 Release 2	$212,157.20	$0.00	$212,157.20
1.3.3 Release 3	$186,392.24	$0.00	$186,392.24
1.3.4 Release 4	$159,138.24	$0.00	$159,138.24
Overall Project	$1,120,218.88	$355,344.41	$764,874.47

Total Project cost = $1,120,218.88

- Decision Tree Analysis with Expected Monetary Value:

Initial Question	Options	Outcome Probabilities	Outcome +/-	Expected Value
		CF=0.1	-1,000,000	-1,000,000*0.1=-100,000
	In house development	PS=0.2	560,150	560,150*0.2=112,030
Business Intelligence System		CS=0.7	1,120,300	1,120,300*0.7=784,210
				Total = $796,240
	Outsource	CS=0.6	1,000,000	1,000,000*0.6=600,000
		CF=0.4	-1,120,300	-1,120,300*0.4=-448,120
				Total =$151,880
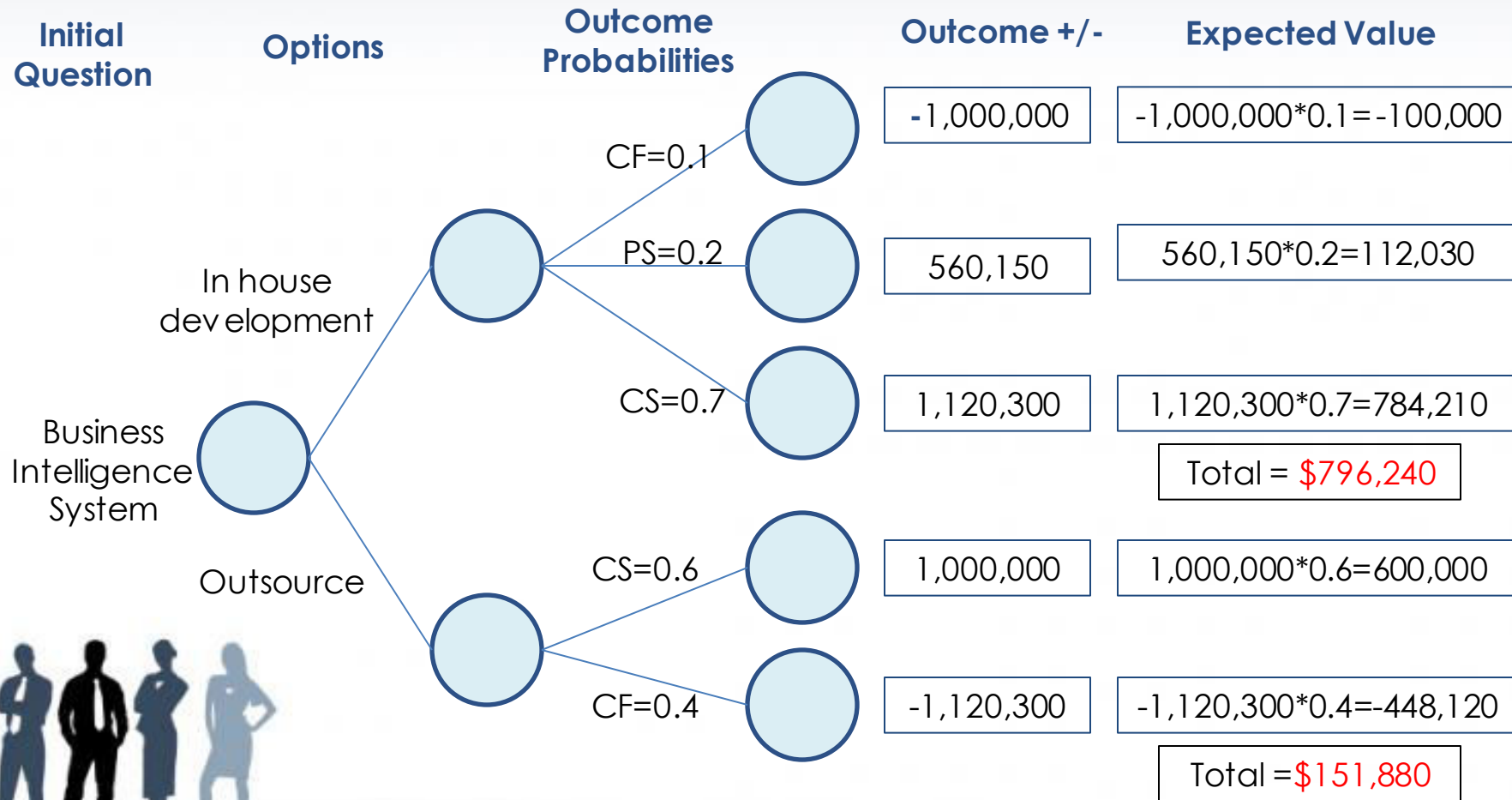
- ## Risk List:

Risk No.	Risk	Risk Description
1	Scope Creep	One of the greatest threats to a successful Business Intelligence project is scope creep. "Scope creep" simply as having a project scope that increases in size due to initially unintended or unanticipated changes to requirements and expectations.
2	Polluted Data	In most cases, polluted data is a result of errors or problems in the production system that registers and stores the data: the data entered is not sufficiently monitored and validated. Because of polluted data, the ETL process becomes much more complex and more difficult to maintain.
3	Data without context	If we have large amounts of data at our disposal but we do not know the meaning (or context), then we have a major problem. If the data and its structure and meaning is not clearly described – metadata -, we cannot determine what we want to measure and modeling the data in the data warehouse coherently is even more problematical. The better the data is described, the faster we can implement BI projects.
4	Large Volumes of data	Large amounts of data can form a barrier when we start using Business Intelligence. The production systems of larger organizations often deal with very large volumes of data (hundreds of millions) on a daily basis. Additionally, large volumes of data may cause delays during the development and testing of the BI system.
5	Absence of data	If an organization does not register the signals that are important for effective business operations, then the senses of that organization malfunction. If this is the case, the organization must return to previous steps in the major Business Intelligence cycle in order to record the required signals in their source system.
6	The complexity of ETL	Extracting and integrating data from different source systems is difficult. According to a renowned research institute, ETL takes up 70 to 80 percent of the total (technical) costs involved with building a BI system.
7	The technology push	The IT department forces a data warehouse and BI technology onto the organization without taking into account the wishes and requirements of users and without properly aligning technology and information needs.

https://www.passionned.com/top-10-bi-risks-and-obstacles-to-success/

- Risk Exposure table:

Risk No.	Risk Probability (RP)	Risk Impact (RI)	Risk Exposure (RP * RI)
1	Medium (0.5)	High (0.9)	0.45
2	Medium Low (0.3)	Medium (0.5)	0.15
3	Medium Low (0.3)	Medium Low (0.3)	0.09
4	Medium (0.5)	Medium High (0.7)	0.35
5	Low (0.1)	Medium (0.5)	0.05
6	Medium high(0.7)	High (0.8)	0.5
7	Low (0.1)	Medium Low (0.3)	0.03
Total Risk Adjustment Factor			1.68

- Probability and Impact Matrix

Impact → Probability ↓	Low	Low Medium	Medium	Medium High	High
Low		7	5		
Low Medium		3	2		
Medium				4	1
Medium High					6
High					

- ## Risk Register:

Risk No.	Risk	Trigger Event	Responsible	Consequence	Probability	Mitigation
1	Scope Creep	Client may be under pressure with a competitor and hence would like to introduce additional features/functionalities	Project Manger1 and Project Manager2	▪ Scope screep has negative impact on a project as the project may be derailed in terms of timelines and may overshoot budget. ▪ Leads to financial loss in case a project gets cancelled. ▪ Leads to lot of rework as the scope keeps changing.	Medium	▪ Understand Project Scope ▪ Document requirements exhaustively ▪ Educate the client about the change control procedures ▪ Trace the Requirements
4	Large Volumes of data	The production systems of larger organizations often deal with very large volumes of data (hundreds of millions) on a daily basis.	Team	▪ Low Performance ▪ Pushes the limit of BI Capacity	Medium	▪ Incremental loading ▪ Leaving out metadata that is already known ▪ Compressing data ▪ Widening the frame within which the processing can take place
6	The Complexity of ETL	Due to aspects such as (poor) quality of source data, large amounts of data or so-called 'back-dated transactions'	Team	▪ ETL takes up 70 to 80 percent of the total (technical) costs involved with building a BI system.	Medium High	▪ Deploying an ETL tool ▪ Balanced architecture ▪ Collaborate with administrators of source systems

- Comparison Table

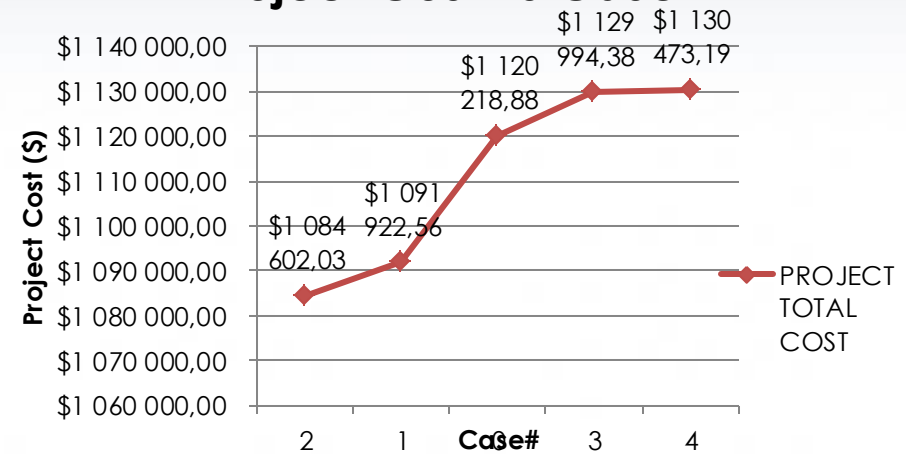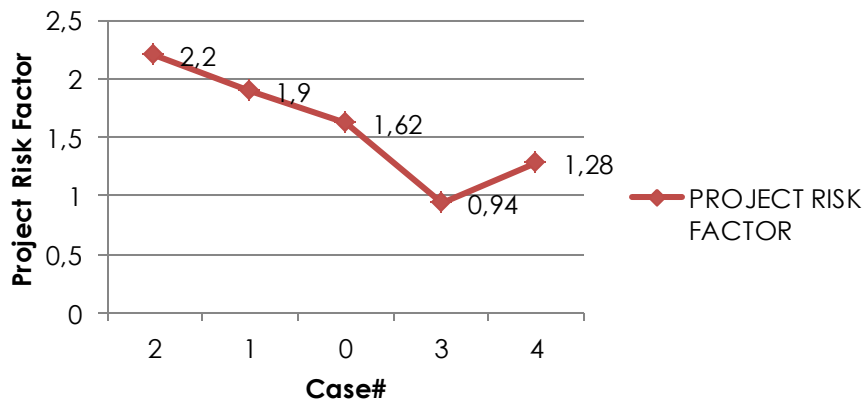| Case #	Project Total Cost	Risk Factor	Duration (Days)	Probability	Expected Value
	(Data will be obtained during Lab 3)	(Data must be calculated before the Lab 3)	(Data will be obtained during Lab 3)	(Data will be given by Instructor before Lab 3)	(Data will be calculated during Lab 3)
0	$1,120,218.88	1.62	571		
1 (Remove 1 expert (8-9 yrs exp) - 1SA)	$1,091,922.56	1.90	640	Partial Failure (35%)	($9,903.71)
2 (Remove 2 experts(8-9 yrs exp) 1SA, 1 Devloper)	$1,084,602.03	2.20	650.38	Complete Failure (30%)	($10,685.06)
3 (add experts - 1developer)	$1,129,994.38	0.94	562.7	Complete Success (15%)	$1,466.33
4(add 1 expert and 1 beginner - 2 developers)	$1,130,473.19	1.28	555.91	Partial Success (20%)	$2,050.86
				EMV	($17,071.58)
				Total EMV	$1,103,147.30
				Conclusion	So, from a risk perspective, this project is worth doing.

- Comparison using Graphs:

Project Duration vs Case#
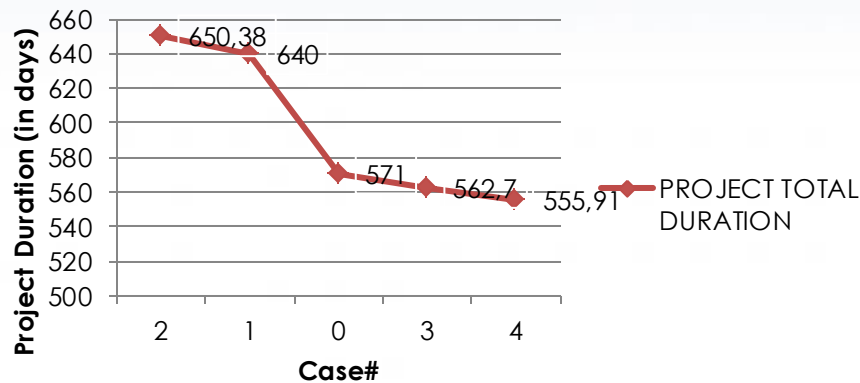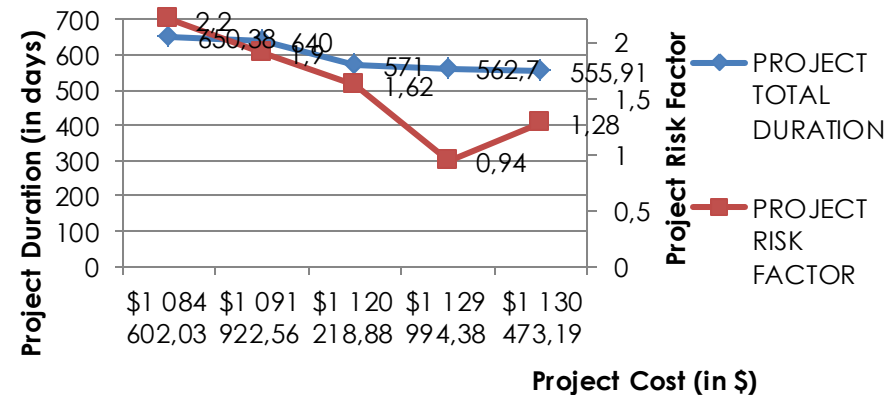

Project Cost vs Case#

Project Risk Factor vs Case#

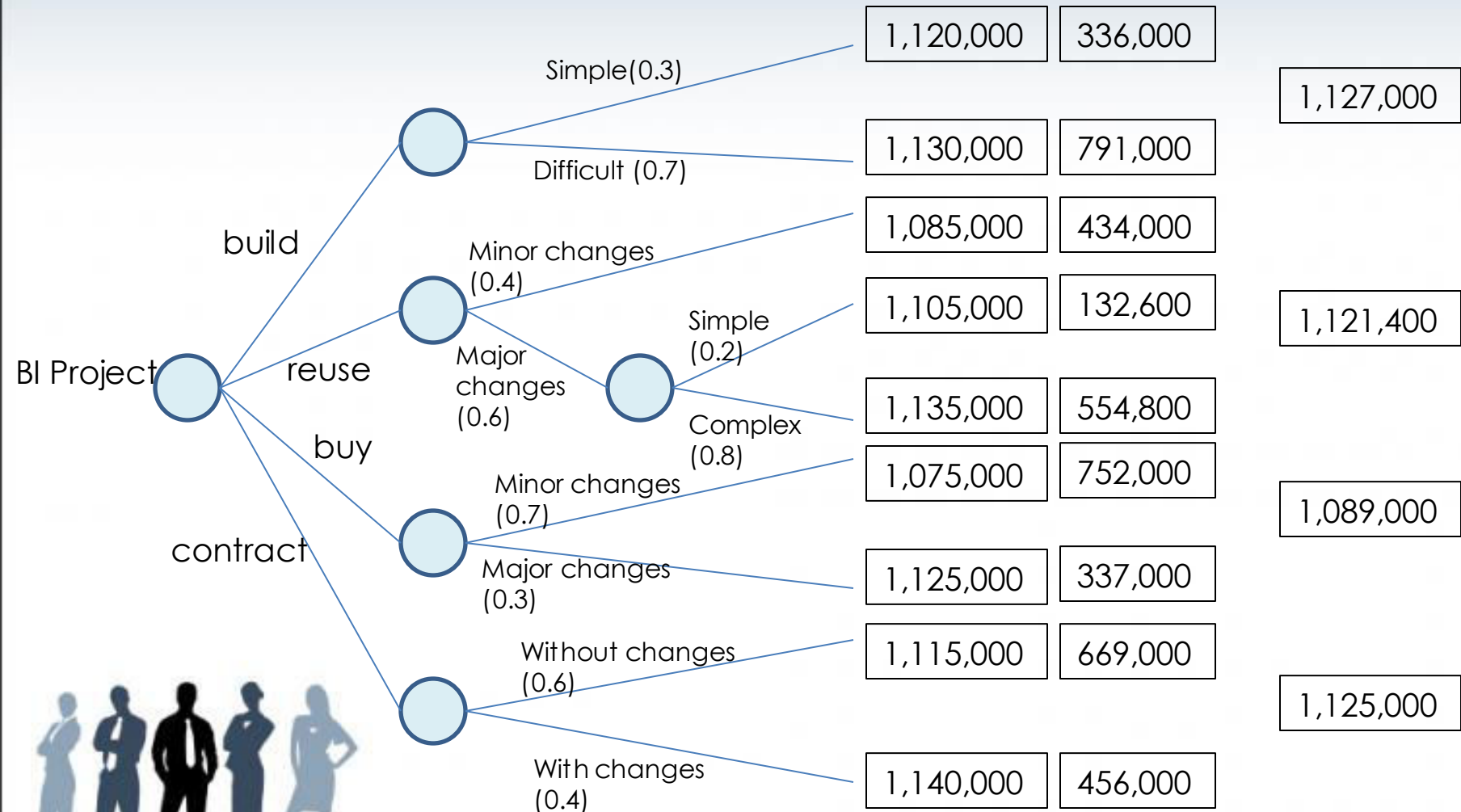## Project duration and Project Risk factor vs Project Cost

- Make or Buy Diagram and Calculations:

1,120,000	336,000

1,127,000

1,130,000	791,000
1,085,000	434,000
1,105,000	132,600

1,121,400

1,135,000	554,800
1,075,000	752,000

1,089,000

1,125,000	337,000
1,115,000	669,000

1,125,000

1,140,000	456,000

BI Project

- build
- reuse
- buy
- contract

Simple(0.3)
Difficult (0.7)
Minor changes (0.4)
Major changes (0.6)
Simple (0.2)
Complex (0.8)
Minor changes (0.7)
Major changes (0.3)
Without changes (0.6)
With changes (0.4)

- Type of Contract to be used:

Fixed Price Contract
Fee: $1,080,000

Cost plus Fixed Fee Contract
- Estimated price of project: $ 1,080,000
- Fixed Fee: $30,000
- **If the project is completed by the seller at $1,100,000**,
then the seller would receive
$ 1,100,000 + $30,000 +
($ 1,080,000 - $1,100,000) = $ 1,110,000
Profit = $10,000
- **If the project is completed by the seller at $1,060,000**, then
the seller would receive
$ 1,060,000 + $30,000 = $1,090,000
Profit = 30,000

Cost plus Incentive Fee Contract
- Sharing Formula is 75/25
- Allowable Cost: $ 1,080,000
- Target Fee: $40,000
- Maximum Fee: $60,000
- Minimum Fee: $25,000
- **If the project is completed by the seller at $1,050,000,**
then the seller would receive
$1,050,000 + (1,080,000 - 1,050,000)*0.25
+40,000 = $1,097,500
Profit = $47,500
- **If the project is completed by the seller at $1,100,000**,
then the seller would receive
$1,100,000 + $25,000 = $1,125,000
Profit = $25,000

- Selected Contract:

    Cost plus Incentive Fee Contract

- Justification:

    A cost-plus incentive fee contract provides a way to apply any savings, whether financial or by completing work ahead of schedule, that the contractor is able to secure to the pay that he or she will receive for the contracted work.

Title:

Business Intelligence Systems

Introduction:

Business intelligence (BI) is a technology-driven process for analyzing data and presenting actionable information which helps executives, managers and other corporate end users make informed business decisions.

Objectives:

The goal of this project is to design and develop Business Intelligence tool with great data visualizations and ETL Integration. More information than ever lies within our reach today as intelligence is infused into the systems and processes that make our world work. The aim of business intelligence (BI) and performance dashboards is to make sense of the mountains of data available to us and to turn it into usable knowledge.

Project Scope:

BI is evolving in every industry. The scope has expanded to more than just a set of standard, SQL-based reports. Following are the main functionality planned to implement:

- Data visualization is the core of business intelligence. Both business analytics and business intelligence offers a variety of data visualization capabilities to convert the muddled sets of unstructured data into energetic images that convey meaning.
- An analytical dashboard is used to analyze massive amounts of data to allow users to inspect trends, envisage outcomes and discover insights.
- Predictive modeling involves creating, testing and validating a model to best predict the probability of an outcome.

- **Milestones:**

Milestone	StartDate	EndDate
Release 1	4/7/2021	9/6/2021
Release 2	9/7/2021	1/14/2022
Release 3	1/17/2022	5/5/2022
Release 4	5/6/2022	8/5/2022

- **Project Schedule:**
  - Project Start Date: 06/01/2020
  - Project End Date: 08/08/2022

- **Work Requirements:**
  - Set the Key Performance Indicators
  - Find out the best software.
  - Define the tasks & Delegate the Resources

- **Critical Success Factors:**
  - System Quality and Information Quality
  - Performance
  - Business-Executive involvement

1. **Background:**
   - CS591_CP_Team_03 is developing Business Intelligence Systems. The purpose of the document is request to perform execution of testing the business key performance indicators in accordance with competitive intelligence.

2. **Project Goals:**
   - The purpose of business intelligence in a business is to help corporate executives, business managers, and other operational workers make better and more informed business decisions.

3. **Schedule:**
   - Bids shall be firm offers and shall remain valid for acceptance 60 days following the RFQ closing date.

4. **Statement of Work:**

   Details enclosed in Statement of Work.

5. **Technology constraints:**

   Details enclosed in Statement of Work.

6. Elements of Proposal:

- Experience of minimum 5 years in Business Intelligence Systems
- Detailed document of KPI test plan.
- Knowledge on business and metrics evaluation
- Knowledge in mostly used Business Intelligence

7. Additional Options:

- Although the entity has specific requirements, it is also interested in your ideas for integrating new KPI's into the development of BI System. We encourage respondents to consider and propose alternative solutions for implemented metrics.

8. Evaluation Criteria:

- Proposals will be evaluated based on previous experience in Business intelligence Systems, quality of previous work, time to completion and price.

9. Vendor Reference:

- Vendors should provide their contact for further processes.

10. Required Bid Content:

- Scope of Work
- Bid Amount – as hourly rate/total bid
- Please fill the below table

Item	Description	Unit Cost	Extended Cost
1	Unit Test case design, test script, results, supporting document and traceability of software development		
2	Software integration test design, test case, results, supporting documentations and traceability to software development		
3	System integration test design, test case, results and supporting documentations traceability to system requirements		

11. Contact Information:

- Send your bids/proposals to:
  Prasanthi Putta
  Bradley University
  Peoria - 61615

CONCLUSION

- Business intelligence tools are essential for companies to stay competitive and maximize revenue streams. Below are the key benefits of using BI System:
    - Fast and accurate reporting
    - Valuable business insights
    - Competitive analysis
    - Better data quality
    - Increased customer satisfaction
    - Identifying market trends
    - Increased operational efficiency
    - Improved, accurate decisions
    - Increased revenue

- https://community.jaspersoft.com/wiki/jasperreports-server-features
- https://mindmajix.com/pentaho-tutorial
- https://www.predictiveanalyticstoday.com/birt-business-intelligence/
- https://www.predictiveanalyticstoday.com/apache-superset/
- https://www.predictiveanalyticstoday.com/redash/
- http://worldcomp-proceedings.com/proc/p2012/SER2400.pdf
- https://www.javatpoint.com/software-engineering-functional-point-fp-analysis

Thank You