**Functional Requirements Document (FRD)**

**TABLE OF CONTENTS**

**Page**

**1.0 SCOPE......................................................................................................................1**

1.1 Background ......................................................................................................1

1.2 Purpose .............................................................................................................1

1.3 Reference..........................................................................................................1

1.4 Terms and Abbreviations ................................................................................. 2

1.5 Requirement Wording Convention .................................................................. 4

**2.0 SYSTEM OVERVIEW...........................................................................................5**

2.1 MarineNet Architecture....................................................................................5

2.1.1 Distance Learning Center.....................................................................6

2.1.2 Functional Learning Center..................................................................7

2.1.3 Area Learning Center ...........................................................................8

2.2 Background ......................................................................................................9

2.3 Objective ........................................................................................................10

2.4 Existing Methods and Procedures ..................................................................10

2.5 MarineNet Operational Concept ....................................................................10

2.5.1 Summary of Improvements ................................................................11

2.5.2 Summary of Impacts ..........................................................................12

2.5.3 Assumptions and Constraints .............................................................12

**3.0 SYSTEM REQUIREMENTS...............................................................................13**

3.1 General Requirements ....................................................................................14

3.1.1 Usability .............................................................................................14

3.1.2 Scalability...........................................................................................14

3.1.3 Synchronization..................................................................................14

3.1.4 System and Database Connectivity ....................................................15

3.1.5 Standards ............................................................................................15

3.1.6 General System Administration Functions.........................................16

3.2 Specific Functional Requirement ...................................................................17

3.2.1 Student Administration.......................................................................17

3.2.2 Scheduling ..........................................................................................19

3.2.3 Launch and Control ............................................................................20

3.2.4 Performance Tests ..............................................................................21

3.2.5 Cataloging ..........................................................................................21

3.2.6 Reports................................................................................................22

3.3 Response Times..............................................................................................23

3.3.1 General Timing Requirements ...........................................................23

3.4 Capacity Limits ..............................................................................................23

iii

3.5 Functional Area System Functions.................................................................24

3.5.1 Student Administration.......................................................................24

3.5.2 Scheduling ..........................................................................................28

3.5.3 Launch and Control ............................................................................28

3.5.4 Performance Tests ..............................................................................29

3.5.5 Cataloging ..........................................................................................30

3.5.6 Reports................................................................................................30

3.6 Inputs and Outputs..........................................................................................32

3.7 Database Characteristics.................................................................................33

3.8 Failure Contingencies.....................................................................................33

**4.0 DESIGN CONSIDERATIONS ............................................................................34**

4.1 System Description.........................................................................................34

4.2 Flexibility/Scalability/Modularity..................................................................34

**5.0 ENVIRONMENT..................................................................................................35**

5.1 Equipment Environment.................................................................................35

5.2 Support Software Environment ......................................................................35

5.3 Communications Requirements .....................................................................35

5.4 Hardware ........................................................................................................35

5.5 Software..........................................................................................................35

5.6 Interfaces ........................................................................................................35

**6.0 SECURITY ............................................................................................................36**

6.1 Data Integrity..................................................................................................36

6.2 Communications.............................................................................................36

**7.0 SYSTEM DEVELOPMENT PLAN ....................................................................37**

**8.0 COST FACTORS..................................................................................................38**

**GLOSSARY.......................................................................................................................39**

**APPENDIX A: MCIAIS INTERFACE REQUIREMENTS........................................41**

**APPENDIX B: MCIAIS INTERNAL DATABASE DOCUMENTATION................53**

**TABLE OF CONTENTS**

1 Introduction 1

1.1 Document Description 1

1.1.1 Purpose 1

1.1.2 Audience 1

1.1.3 Objectives 1

1.1.4 Project Benefits 2

1.1.5 Assumption and Dependencies 2

1.1.6 Risks and Constraints 3

1.1.7 Points of Contacts 4

2 Current SYSTEM Functionality 5

2.1 Current Business Process 5

3 Proposed System Functionality 6

3.1 Proposed System Overview 6

3.1.1 Proposed System Justification 6

3.1.2 Proposed System Description 6

4 Functional Requirements 8

4.1 Requirements (Module) Overview High Level 8

4.1.1 External System: 8

4.1.2 Internal System 10

4.2 Requirements Traceability 1

5 System Requirements 2

5.1 System Requirements 2

5.1.1 Network 2

5.1.2 Hardware and Software Specifications 2

6 Operational Requirements 4

6.1 Operational Requirements 4

6.1.1 Security 4

6.1.2 System Availability 4

6.1.3 Performance 4

6.1.4 Historical and Archival Information 4

6.1.5 Disaster Recovery 5

**BRD vs. FRD/FRS – What’s In a Name?**

We, the IT and business people, are usually more comfortable with concepts that can be given an exact definition than with some vaguely defined ideas which complicate our communication and reduce our productivity. The usage of Business Requirements Document (BRD) vs. Functional Requirements Document (BRD) [or] Functional Requirements Specification (FRS) is a clear example where such miscommunication creates a quite a bit of confusion.

Chiron Business Solutions made a study of over 30 samples of documents with either BRD or FRD/FRS titles maintained by reputable IT organizations (most of them being part of Fortune 500 companies) and found out that there is absolutely no agreement in the industry as to which document should contain which information and to which extent of detail. The main topics covered by the above documents were:  Problem/Solution Statement, Current/Proposed Business Process, Risks, Functional Requirements, GUI, Non-Functional Requirements and Data Requirements.  The confusing part is that, regardless of the name, the content of those documents was pretty much the same. Therefore, here comes a question, what is the principal difference between BRD and FRD/FRS?

Since this question falls into the subject of Business Analysis, we thought that the best resource for clarification would be the Business Analysis Body of Knowledge (BABOK), maintained by the International Institute of Business Analysis. We started by looking at their definition of the BRD. According to the BABOK, a ***Business Requirements Document*** is a requirements package that describes *business requirements* and*stakeholder requirements*. To get to the bottom of it, we also need to understand the definition of business and stakeholder requirements, so here they are:

***Business Requirement****–*a higher level business rationale that, when addressed, will permit the organization to increase revenue, avoid costs, improve service, or meet regulatory requirements.

Do any of the topics mentioned above sound like a good fit to be included in a BRD? Not really, with the exception of Current vs. Proposed Business Process and, possibly, Risks.

Now, let’s see what a stakeholder requirement means:

***Stakeholder requirements*** are statements of the needs of a particular stakeholder or class of stakeholders. They describe the needs that a given stakeholder has and how that stakeholder will interact with a solution. Stakeholder requirements serve as a bridgebetween *business requirements* and various categories of *solution requirements*.

“Bridge” does not mean the actual solution requirement. It means some transitionalinformation. We still need yet another definition to understand the meaning of a *solution requirement*:

***Solution requirement*** – a characteristic of a solution that meets the business and stakeholder needs. May be subdivided into *functional*and *non-functional requirements*.

Based on these definitions, here comes the moment of truth – solution requirements (i.e. functional and non-functional ones) are NOT the same thing as business/stakeholder requirements. The former should go into the FRD and the latter – into the BRD (which is a collection of high level business needs and is not meant to provide detailed requirements). Whether or not a project needs both, BRD and FRD, depends on its complexity, but it is important to understand the purpose of each one.

Going back to our study, most of the documents that were called BRD were in fact FRD because they contained such things as behavior and information that the solution would manage, i.e. functional requirements. Calling them the wrong name would not really be a big issue as long as this misconception was consistent across the industry. The bigger problem is that, unfortunately, the formatting and contents of those documents are so dramatically different from one organization to another that it makes it very challenging to discuss your understanding of this documentation once you go outside of your particular organization.

BRD/FRD questions have become pretty popular during BA interviews, and answering them becomes a guessing game because it is very hard for you to know what your potential employer considers to be a good definition of BRD or FRD.

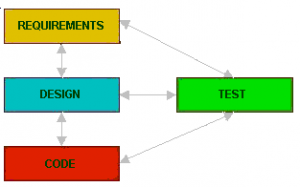
Our advice to BA candidates would be to stick to the BABOK definitions (as this is the only industry recognized organization attempting to streamline BA knowledge) and to try to talk through your understanding of the actual concepts (i.e. business requirements and solution requirements) versus how they can be packaged inside a particular document. It is important to let your interviewer know that you are aware of various types of documentation, and your solid knowledge of the above types of requirements and their corresponding usages will help you allocate them properly to the documentation templates used by your prospective employer. Most organizations would expect a Business Analyst not to stop at the business requirements point, but to take them one step further to the solution requirements level. Therefore, you should be equally comfortable discussing both requirements groups to succeed in the interview.

**Why is it necessary to use a traceability matrix?**

Tracking all the requirements outlined in the functional specification document and checking whether all the requirements have been met by the end product can be a cumbersome and a laborious process. Not surprisingly, many enterprise quality systems, such as CMMi, Six Sigma or ISO 9000, require organizations to have formal traceability procedures.

Traceability Matrix is an industry-accepted format for tracking requirements. It provides a convenient format that helps to visually represent associations between user requirements for the system built and the work products (project artifacts) developed and implemented to verify those requirements.

These work products include use cases, business rules, data and GUI requirements, design specifications, software code, test plans, test results and other artifacts of the systems development process.

[](http://www.chiron-solutions.com/chiron-professional-journal/wp-content/uploads/2011/01/cpj_pic20110127_1.png)

The BABOK v.2.0 provides the following definition of Requirements Traceability:

*Requirements traceability identifies and documents the lineage of each requirement, including its backward traceability (derivation), its forward traceability (allocation) and its relationship to other requirements. Traceability is used to help ensure solution conformance to requirements and to assist in scope and change management, risk management, time management, cost management, and communication management. It is also used to detect missing functionality or to identify if implemented functionality is not supported by a specific requirement.*

**Forward Traceability**

Forward traceability ensures proper direction of the evolving product and indicates the completeness of the subsequent implementation. For example, if a business rule can’t be traced forward to one or more business processes (use cases) then the product requirements specification is incomplete and the resulting product may not meet the needs of the business. If a use case cannot be traced forward to its associated architectural design elements, then the architectural design is not complete and so on. If, on the other hand, there are changes in the business environment (e.g., a business rule change or a standard change), and good forward traceability has been maintained, that change can be traced forward to the associated requirements and all of the work products that are impacted by that change. This greatly reduces the amount of effort required to do a thorough job of impact analysis. It also reduces the risk that one of the affected work products is forgotten, resulting in an incomplete implementation of the change.

**Backward Traceability**

Backwards traceability helps ensure that the evolving product remains on the correct track with regards to the original and/or evolving requirements. The objective is to ensure that we are not expanding the scope of the project by adding design elements, code, tests or other work products that are not specified in the requirements. If there is a change needed in the implementation or if the developers come up with a creative, new technical solution, the change/solution should be traced backwards to the requirements and the business needs to ensure that it is within the scope of the desired product. For example, if there is a work product element that doesn’t trace backwards to the product requirements, there may be a possibility that there is a missing requirement because the work product element really is needed. The second possibility is that something has been added to the functionality that should not be part of the product. Another benefit of backward traceability comes when a defect is identified. One has to question if it is just a code defect or does it trace back to a defect in the design or requirements? If it’s a design or requirements defect, what other work products might be impacted by the defect?

**Sample Traceability Matrix describing the relationships between Development Artifacts**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Process** | **Use Case** | **Business Rules** | **Design Specification** | **Source Code Files** | **Test Cases** |
| Foreign Exchange         FX Rates  Load Process | Load FX Rates FS1.1.1 | BR001, BR005, BR011, BR024 | FX Rates Load Design Specifications section DS2.1 | FXReuters.PRG | Test Case No.: 1.1.1 to 1.1.10 (Reference: FXRate\_Load Tests.Doc) |
| Foreign Exchange Trade Input | Input FX Trade FS2.1.1 | BR004 | FX Trade Input Design Specifications DS2.2 | FXTradeInput.PRG | Test Case No.:  2.1.1 to 2.1.10 (Reference: FXTrade\_Input Tests.Doc |
| Foreign Exchange Trade Confirmation | Confirm FX Trade FS3.1.1 | BR003, BR007 | FX Trade Input Design Specifications DS3.2 | FXTradeConfirm.PRG | Test Case No.:  3.1.1 to 3.1.10 (Reference: FX\_Confirmation Tests.Doc |
| Foreign Exchange Trade Settlement | Settle FX Trade Input FS4.1.1 | BR002, BR003, BR019 | FX Trade Input Design Specifications DS2.2 | FXTradeSettle.PRG | Test Case No.:  4.1.1 to 4.1.10 (Reference: FX\_Settlement Tests.Doc |