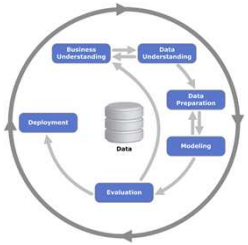
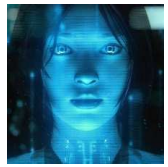
Transactional
vs
Analytical Data

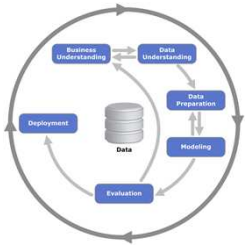
(Assembling Source Data to Train Intelligence)



W3COMPUTING
A DEVELOPER REFERENCE WEBSITE



Richard Frederick, PMP (rfrederick.pmp@gmail.com; 214-755-7035 talk or text; www.linkedin.com/in/rfrederick)



CBDA CERTIFIED IIBA

ISO International Organization for Standardization

ANSI American National Standards Institute

sas

OMG OBJECT MANAGEMENT GROUP

INCOSE International Council on Systems Engineering

IEEE

PMI Project Management Institute

Scaled Agile Framework

IIBA International Institute of Business Analysis

UNIFIED MODELING LANGUAGE

W3COMPUTING A DEVELOPER REFERENCE WEBSITE

Requirements Development Management (RDM) for

Business Data Analytics

(The Language of Data)

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Requirements Agenda

Business Data Analytics "The Language of Data"

01-FOUNDATION

- **LAB-Introductions (Name, Job Title, Objectives)**
- Dashboards and Robots (Data Mining & Machine Learning)
- Requirements and Testing (Four Quadrants)
- What are Structured Language Requirements? (Structured English and Structured Query Language)
- Why Should You Care? (Primary Source of Project Problems)
- How Do They Work? (Discreet Intellectual Property Inventory)
- Types of Requirements (Product, Project, DATA)
- Natural Language Processing (Morphology, Semantics, Syntax and Linguistics)
- OMG-SBVR (Semantics of Business Vocabulary & Rules)
- IEEE-EARS (Easy Approach to Requirements Syntax)
- INCOSE (Rules for Writing Requirements) & QVscribe
- Waterfall and Agile (Assembly Methods)

02-ELICIT

- **LAB-Vision/Scope (Seek to Understand)**

Elicitation Techniques:

- Document Analysis (Low Hanging Fruit)
- Interface Analysis (Navigation & Functionality)
- Benchmarking (Actual Data)
- Brainstorming (Every Idea is a Good Idea until it becomes a Bad Idea)
- Prototyping (Minimum Viable Product)
- Reverse Engineering (Begin with the End in Mind)
- Interview (Thinking Questions)
- Workshop (Group Interviews)
- Observation (What do you See?)
- Survey Questionnaire (Paper equals proof)

03-ANALYZE

- What are Models? (Pictures of Language)
- **LAB-The Language of Modeling (GIVEN pre WHEN process THEN output-result)**
- Types of Models (Context-Structure, Usage, Data Behavior, Process Flow)
- Context-Structure (Vision, Roadmap, Scope WBS)
- Usage (EPIC, UseCase, UserStory, Feature)
- Data Behavior (ERD, JOIN-Denormalization, Star Schema, Dimensional OLAP, Dashboard, Intelligence)
- Data Behavior (Data Dictionary, DataFlow, Data Structure Instance, Data Element Attribute, Data Store)
- Data Behavior (Process Logic, Business Rules)
- Process Flow (Swimlane)

04-DOCUMENT

- Categorization, Organization, Documentation, Integration, Automation
- Making Documents Easy to Read (Fonts & Navigation)
- Document Types (BRD, TRD)
- **LAB-Business Requirement Document (Concept of Operation)**
- Technical Requirement Document (System Specification)

05-VALIDATE

- Validation thru Triangulation (Prep Drills)
- Traceability (Project Unique Identifier)
- Requirements Baseline (ROM Estimate, Planning Estimate, Definitive Estimate)
- **LAB-Estimating Story Points (Complexity and Risk)**
- Lessons Learned (Course Wrap-Up)

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Project Management Agenda

Business Data Analytics "The Language of Data"

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- INCOSE (Rules for Writing Requirements) & QVscribe
- Waterfall and Agile (Assembly Methods)
- About PowerBI (Business Intelligence)

ENVISION (Initiate)

01-Understand the Business Need

- **Determine BUSINESS OBJECTIVES**
- Background
- Business Objectives
- Success Criteria
- **Assess SITUATION**
- Inventory of Resources
- Requirements, Assumptions, and Constraints
- Risks and Contingencies
- Terminology
- Costs and Benefits
- **LAB-Charter Vision**

PLAN (Increment Zero)

02-Understand the Data

- **Collect INITIAL DATA**
- Data Collection Notes
- **Describe DATA**
- Data Description Notes
- **Explore DATA**
- Data Exploration Notes
- **Verify DATA QUALITY**
- Data Quality Notes
- **LAB-WBS Roadmap**

DEVELOP (Execute)

03-Prepare the Data

- **Select DATA**
- Rationale for Inclusion/Exclusion
- **Clean DATA**
- Data Cleaning Notes
- **Construct DATA**
- Derived Attributes
- Generated Records
- **Integrate DATA**
- Merged Data
- **Format DATA**
- Reformatted Data
- **LAB-Duration Story Points**

04-Model the Data

- **Select MODELING TECHNIQUES**
- Modeling Technique
- Modeling Assumptions
- **Generate TEST DESIGN**
- Test Design
- **Build MODEL**
- Parameter Settings Model
- Model Description
- **Assess MODEL**
- Model Assessment
- Revised Parameter Settings
- **LAB-Risks & Release Schedule**

STABILIZE (Control)

05-Evaluate the Data

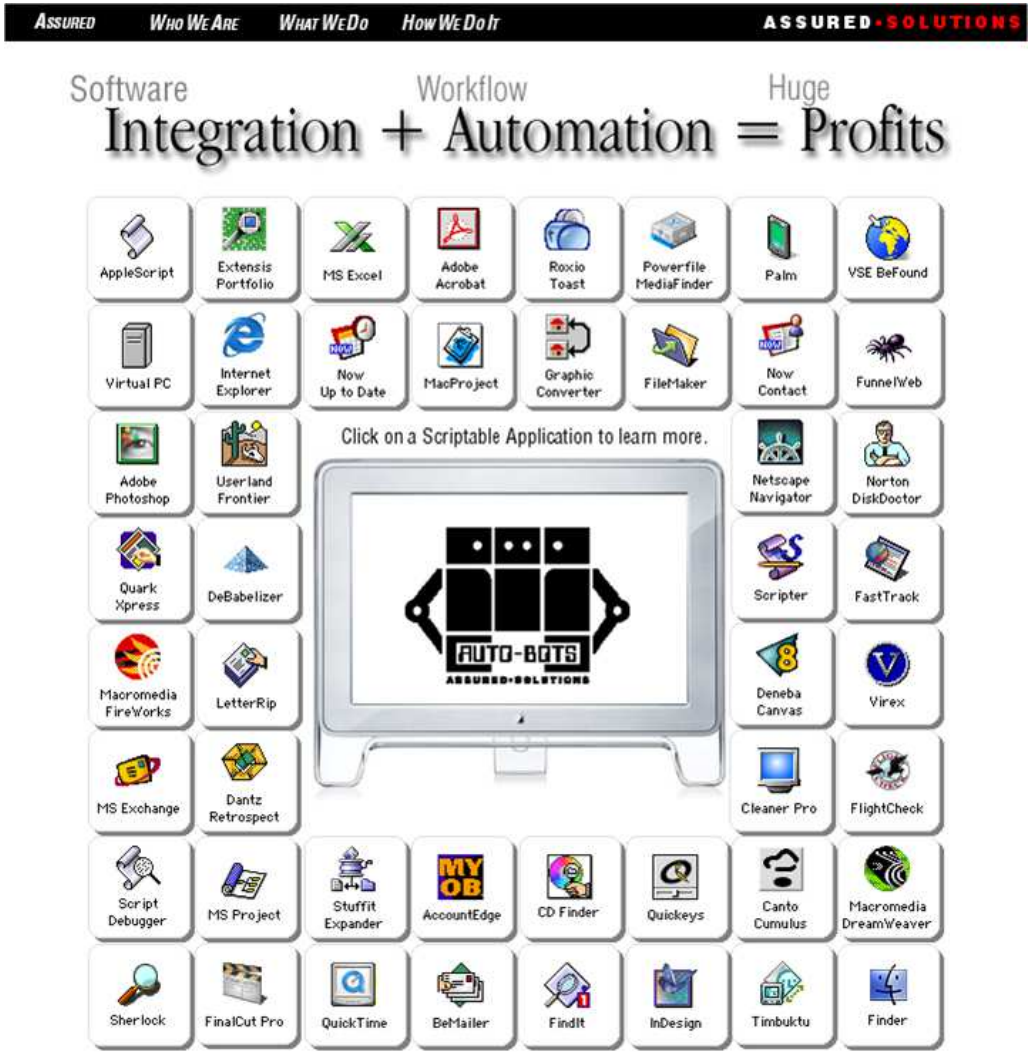
- **Evaluate RESULTS**
- Assess the Results against the Business Success Criteria
- **Review PROCESS**
- Review of Process
- **Determine NEXT STEPS**
- List Possible Actions
- Decision
- **LAB-One Page Project Manager (OPPM)**

DEPLOY (Close)

06-Deploy the Solution

- **Plan DEPLOYMENT**
- Deployment Plan
- **Plan MONITORING & MAINTENANCE**
- Monitoring & Maintenance Plan
- **Produce FINAL REPORT**
- Final Report
- Final Presentation
- **Review PROJECT PLAN**
- Experience Documentation
- **LAB-Lessons Learned (Train the Trainer)**

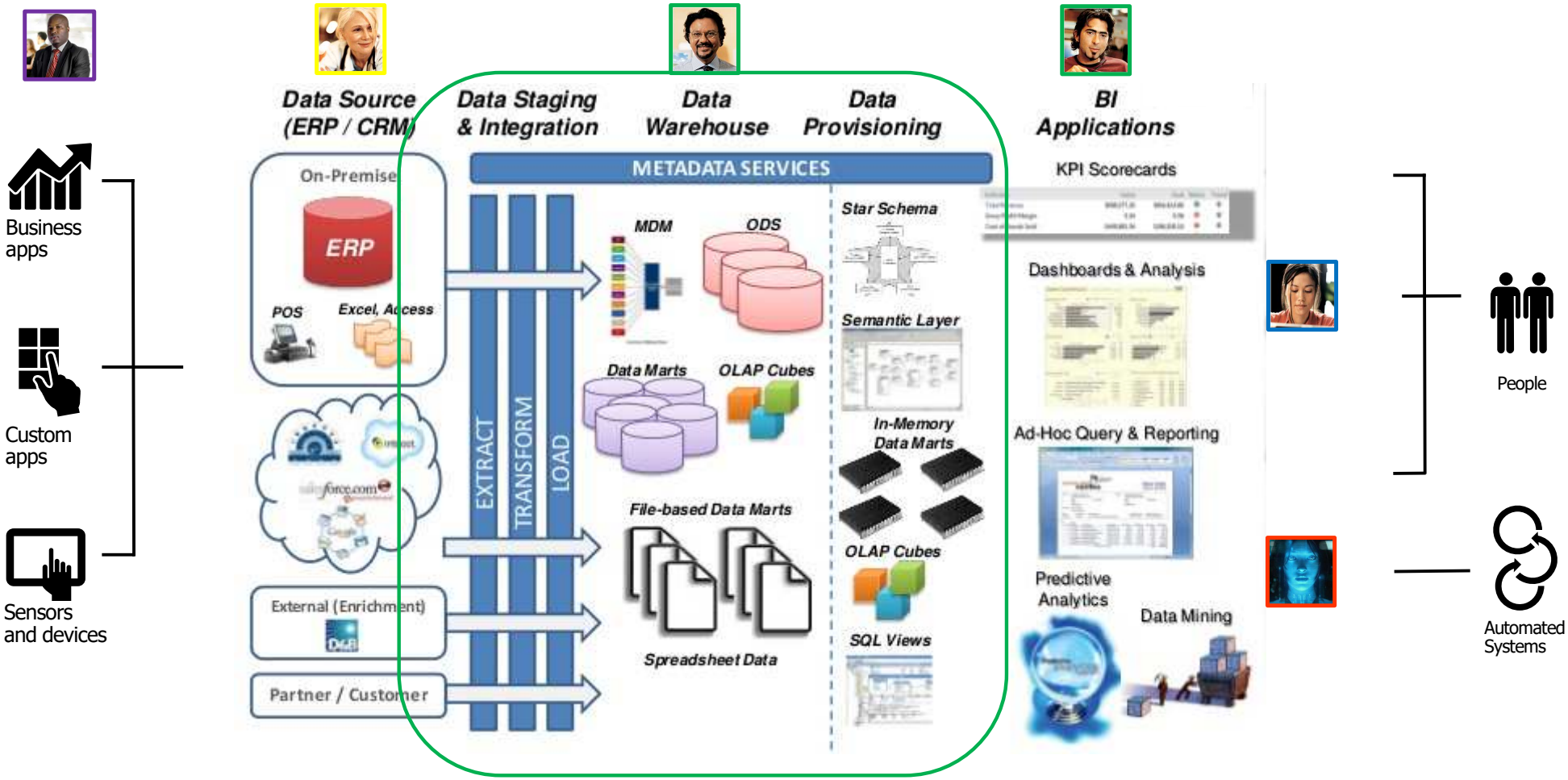
Assured Solutions



Overview "Seek to Understand"

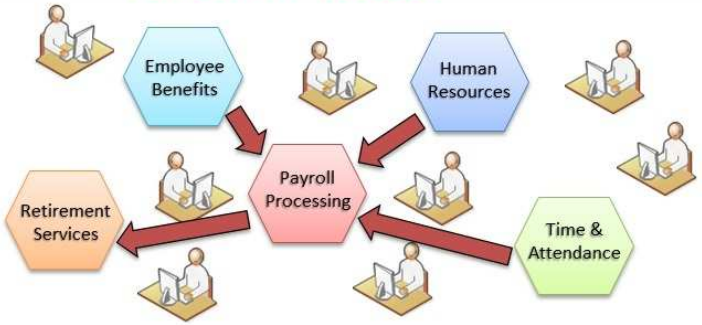
- Design (Transactional Structure vs Analytical Structure)
- Source (Operational Data vs Data Warehouse)
- Motive (Transaction Volume vs Historical Reporting & Analysis)
- Complexity (SQL Data Creation vs SQL Data Manipulation)

Transactional Data Assembled into Analytical Data

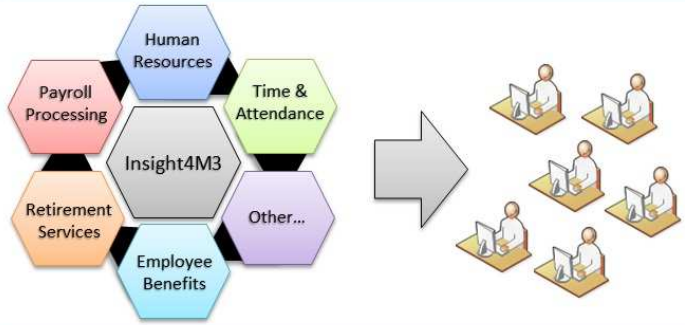


Transactional Data Assembled into Analytical Data

"Transactional" focused!



Unified Insight4M3 Data Warehouse



Consistent Analytical & Reporting Framework

Business apps

Custom apps

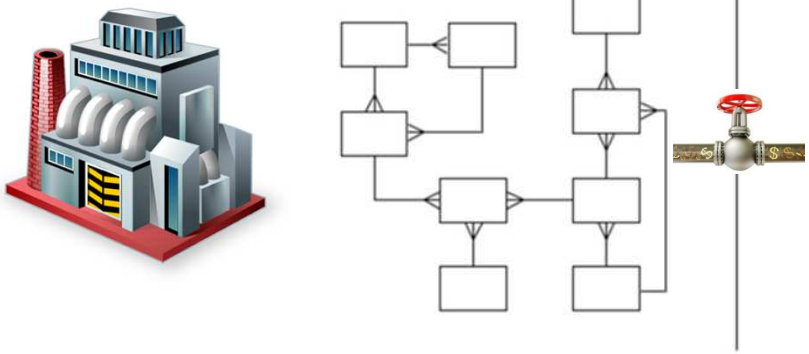
Sensors and devices

People

Automated Systems

Transactional

Analytical



Transactional Data Assembled into Analytical Data

Online Transaction Processing (OLTP)

- Application Oriented

Loans, Credit Cards, Savings, Trust

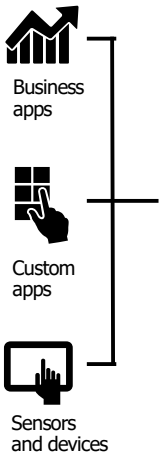
- Detailed data
- Used to run business
- Current up to date
- Isolated Data
- Repetitive access
- Clerical User

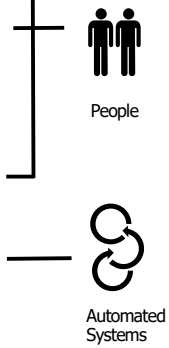
Online Analytical Processing (OLAP)

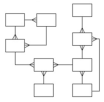
- Subject Oriented

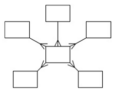
Customer, Vendor, Product, Activity

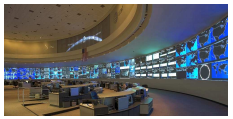
- Summarized data
- Used to analyze business
- Snapshot data
- Integrated Data
- Ad-hoc access
- Knowledge User (Manager)











Transactional Data Assembled into Analytical Data

	OLTP	OLAP
Design	Normalized(1st normal form, Second Normal Form and Third Normal Form)	Denormalized(Dimension and Fact Design).
Source	Daily Transactions	OLTP
Motive	Faster Insert Update, Deletes and Improve Data quality by reducing redundancy.	Faster analysis and Search by combining tables.
SQL Complexity	Simple and Medium	Highly Complex due to analysis and forecasting.

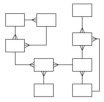
Business apps

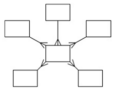
Custom apps

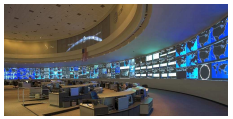
Sensors and devices

People

Automated Systems







Transactional Data Assembled into Analytical Data

Entity Relationship

Data Structure Instance

Transactional Data

Data Creation Language

CREATE TABLE
INSERT INTO
UPDATE
DELETE
COMMIT
ROLLBACK

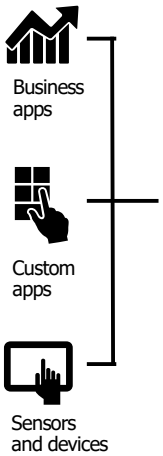
Star Schema

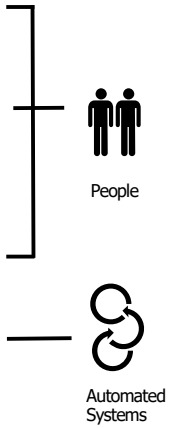
Data Structure Instance

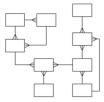
Analytical Data

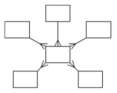
Data Manipulation Language

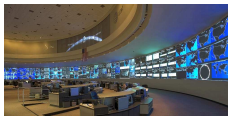
SELECT
FROM
JOIN
WHERE
HAVING
GROUP BY
ORDER BY











Example Structured English Data Structure Instance

Structured English

AN INSTANCE OF Order CONSISTS OF:
OrderNumber
AND OrderDate
AND EITHER PersonalComputerNumber
OR CorporateAccountNumber
AND ShippingAddress (which is **EQUIVALENT TO** Address)
AND OPTIONALLY BillingAddress (which is **EQUIVALENT TO** Address)
AND ONE OR MORE INSTANCES OF:
ProductNumber
AND ProductDescription
AND QuantityOrdered
AND ProductPrice
AND ProductPriceSource
AND ExtendedPrice
AND SumOfExtendedPrices
AND PrepaidAmount
AND OPTIONALLY BOTH CreditCardNumber
AND ExpirationDate
AND OPTIONALLY QuoteNumber

An instance of Address consists of:
OPTIONALLY PostOfficeBoxNumber
AND StreetAddress
AND City
AND EITHER State OR Municipality
AND OPTIONALLY Country
AND PostalCode

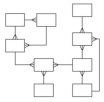
DATA STRUCTURE INSTANCE

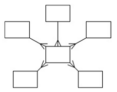
Order=
OrderNumber +
OrderDate +
[PersonalCustomerNumber,
CorporateAaccountNumber]+
ShippingAddress=Address+
(BillingAddress=Address)+
1 {ProductNumber+
ProductDescription+
QuantityOrdered+
ProductPrice+
ProductPriceSource+
ExtendedPrice } N+
SumOfExtendedPrices+
PrepaidAmount+
(CreditCardNumber+ExpirationDate) +
(QuoteNumber)

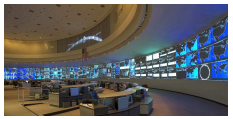
ADDRESS=
(PostOfficeBoxNumber)+
StreetAddress+
City+
[State, Municipality]+
(Country)+
PostalCode

Business apps
Custom apps
Sensors and devices

People
Automated Systems







Data Dictionary Process Specification Form

Business apps

Custom apps

Sensors and devices

FIELD	DESCRIPTION
Data Process ID Number:	The process number, which must match the process ID on the data flow diagram. This specification allows an analyst to work on or review any process, and to locate the data flow diagram containing the process easily.
Name:	The process name, which again must be the same as the name displayed in the process symbol on the data flow diagram.
Description:	A brief description of what the process accomplishes.
Input Data Flow:	A list of input data flows, using the names found on the data flow diagram. Data names used in the formula or logic should match those in the data dictionary to ensure consistency and good communication.
Output Data Flow:	The output data flows, also using data flow diagram and data dictionary names.
Type of Process:	An indication of the type of process: batch, online, or manual. All online processes require screen designs, and all manual processes should have well-defined procedures for employees performing the process tasks.
Subprogram/Function Name:	If the process uses prewritten code, include the name of the subprogram or function containing that code.
Process Logic:	A description of the process logic that states policy and business rules in everyday language, not computer language pseudo-code
Refer To:	If there is not enough room on the form for a complete structured English description, or if there is a decision table or tree depicting the logic, include the corresponding table or tree name.
Unresolved Issues:	List any unresolved issues, incomplete portions of logic, or other concerns. These issues form the basis of the questions used for follow-up interviews with users or business experts you have added to your project team.

Process Specification Form

Number 1.3
Name Determine Quantity Available
Description Determine if an item is available for sale. If it is not available, create a backordered item record. Determine the quantity available.

Input Data Flow
Valid Item from Process 1.2
Quantity on Hand from Item Record

Output Data Flow
Available Item (Item Number + Quantity Sold) to Processes 1.4 & 1.5
Backordered Item to Inventory Control

Type of Process: ☑ Online ☐ Batch ☐ Manual
Subprogram/Function Name

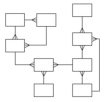
Process Logic:
IF the Order Item Quantity is greater than Quantity on Hand
  Then Move Order Item Quantity to Available Item Quantity
    Move Order Item Number to Available Item Number
ELSE
  Subtract Quantity on Hand from Order Item Quantity
    giving Quantity Backordered
  Move Quantity Backordered to Backordered Item Record
  Move Item Number to Backordered Item Record
  DO write Backordered Record
  Move Quantity on Hand to Available Item Quantity
  Move Order Item Number to Available Item Number
ENDIF

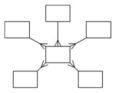
Refer to: Name:
☐ Structured English ☐ Decision Table ☐ Decision Tree

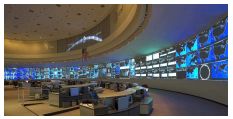
Unresolved Issues: Should the amount that is on order for this item be taken into account? Would this, combined with the expected arrival date of goods on order, change how the quantity available is calculated?

People

Automated Systems







Summary “Train the Trainer”

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- Motive (Transaction Volume vs Historical Reporting & Analysis)
- Complexity (SQL Data Creation vs SQL Data Manipulation)

Let's stay in contact:

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