



# Constructing a Solid Data Structure for an Archaeological Site

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# Topics

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- ✦ Purposes of a Site Information System
- ✦ Relational Database Technology
- ✦ Building a Solid Data Structure
- ✦ A Tour of the Murlo Information System

# Purposes of a Site Information System

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- ✦ Enter Information
- ✦ Store Information
- ✦ Manipulate Information
  - ✦ Query
  - ✦ Sort
  - ✦ Group
- ✦ Analyze Information
- ✦ Publish Information

# Relational Database Technology

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- ✦ Minimizes redundant data
- ✦ Minimizes empty data
- ✦ Minimizes the space and processing required to manipulate data
- ✦ Allows for accurate aggregation
- ✦ Provides a link from a single datum point to a plethora of related information

# Parts of a Data Structure

Elements (tables)

Attributes (fields or columns)

Artifacts		
CatalogID	Name	Fabric
97-177	Bucchero Rim Fragment	Bucchero
97-178	Decorated Bucchero Handle Fragment	Bucchero
97-179	Stamped Bucchero Handle Fragment	Bucchero
97-180	Incised Bucchero Handle Fragment	Bucchero

Trenches					
TrenchID	Area	AreaNumber	AreaNotes	Year	ElevationPoint
257	Agger	1		1968	302
258	Agger	2		1968	307
259	Agger	3		1969	309

Instances (records or rows)



# Steps to Building a Solid Data Structure

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- ✦ Identifying the Elements
  - ◆ Identifying the Tables
- ✦ Defining the Instances of Each Element
  - ◆ Defining the Records of the Tables
- ✦ Identifying the Attributes of Each Element
  - ◆ Identifying the Fields of Each Table
- ✦ Relating the Elements
  - ◆ Building Table Relationships

# Identification of Elements

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✦ Artifacts

✦ Fragments

✦ Trenches

✦ Loci

✦ Trench Books

✦ Excavators

✦ Conservators

✦ Catalogers

✦ Photographs



# Definition of an Instance

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- ✦ Databases can easily combine elements. They CANNOT break up elements into parts.
- ✦ Set up clear operational definitions.
- ✦ Document and disseminate the definitions.
- ✦ Stick to these definitions.
- ✦ When errors occur, don't change the definition; fix the error.



# Identifying Attributes (Fields)

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## ✠ Artifacts (Dynamic)

- ◆ Description
  - Name
  - Dimensions
  - Condition
  - Fabric
  - Color (Munsell)
  - Description
- ◆ Publication References
- ◆ Photos

## ✠ Fragments (Static)

- ◆ Context
  - Excavation Date
  - Trench
  - Coordinates
  - Depth
  - Locus
- ◆ Site Reference
  - Trench Book
  - Page
  - Find
- ◆ Description

# Types of Data Relationships

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- ✦ 1 to 1 (Might not be a relationship)
- ✦ 1 to Many
- ✦ Many to 1
- ✦ Many to Many (Yuk!)

# Relationships Between Elements

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✠ Artifacts(1)

◆ Fragments( $\infty$ )

✠ Trench Books(1)

◆ Fragments( $\infty$ )

✠ Trenches(1)

◆ Fragments( $\infty$ )

✠ Trenches(1)

◆ Loci( $\infty$ )

✠ Trenches( $\infty$ ) – Trench Books( $\infty$ )

✠ Trenches( $\infty$ ) – Excavators( $\infty$ )



**Artifacts**

<b>ArtifactID</b>
CatalogID
Name
Size
Condition
Fabric
Munsell
Description
References
Photographer
Film
Illustration
Conservation
ConservationDate
Conservator

**Fragments**

<b>FragmentID</b>
ArtifactID
YearExcavated
YearCataloged
CatalogID
Cataloger
EntryDate
Trench
TrenchID
TrenchBook
FullBook
Pages
Page
Find
TrenchBookID
Locus
EW Coordinate1
NS Coordinate1
Depth1
EW Coordinate2
NS Coordinate2
Depth2
EW Coordinate3
NS Coordinate3
Depth3
EW Coordinate4

**Trenches**

<b>TrenchID</b>
Area
AreaNumber
AreaNotes
DisplayName
Year
Notes
ElevationPoint
GridSystem
PropertyOwner
Photo

**TrenchTrenchBooks**

<b>TrenchID</b>
TrenchBookID
TrenchBookPages

**TrenchExcavators**

TrenchID
ExcavatorID

**TrenchBooks**

<b>TrenchBookID</b>
TrenchBookName
PrimaryAuthor

**Excavators**

<b>ExcavatorID</b>
Excavator

# The Future of the Murlo Information System

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- ✦ Complete Data Entry of Finds
- ✦ Scan all Photos
- ✦ Scan all Trench Books
- ✦ Develop Graphical User Interfaces
- ✦ Develop 3D Site Plan
- ✦ Develop Search Engine
- ✦ Publish Catalog to the Web

