Database Harmonization

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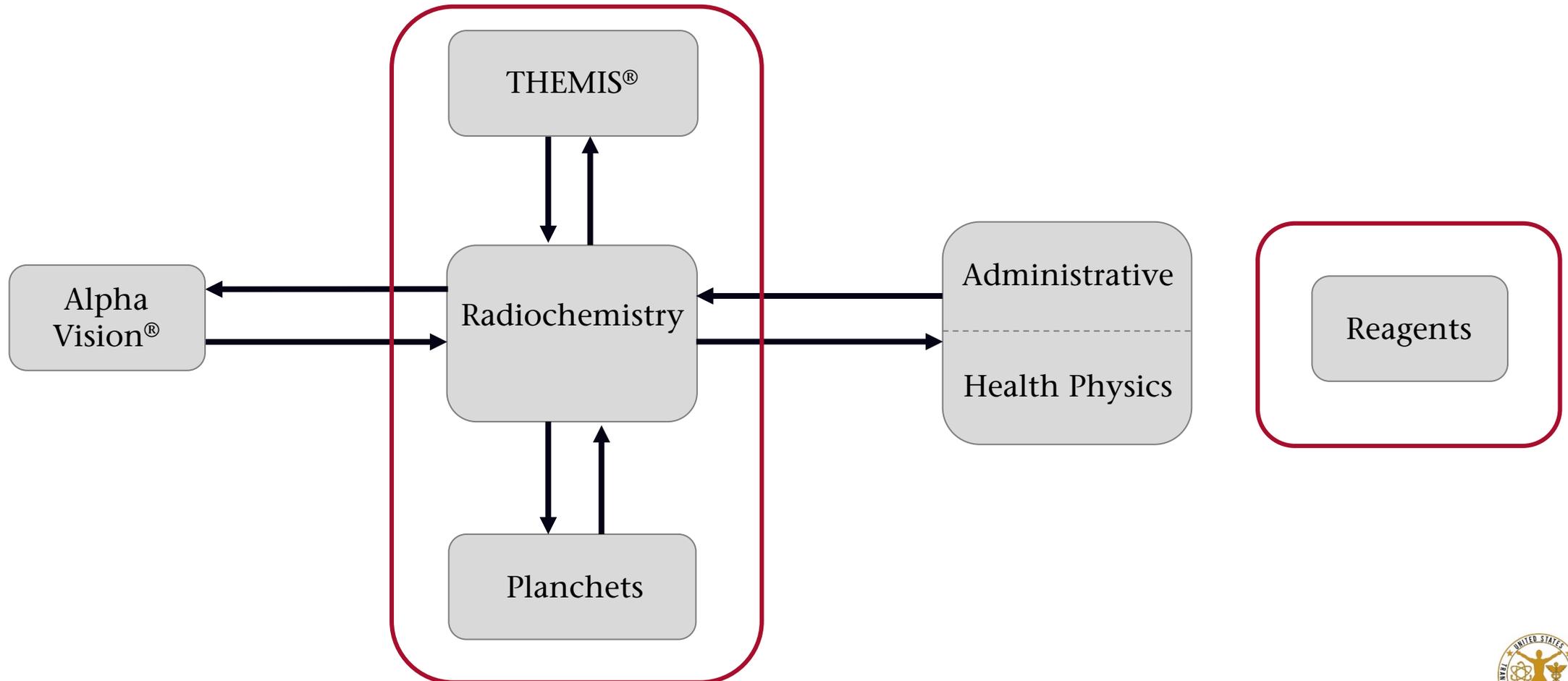
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USTUR Database System

- Most databases started out as standalone databases, to meet specific needs

- Tables associated with the databases were 'linked' on an ad-hoc basis
  - ✓ Automated reading, writing, copying of data
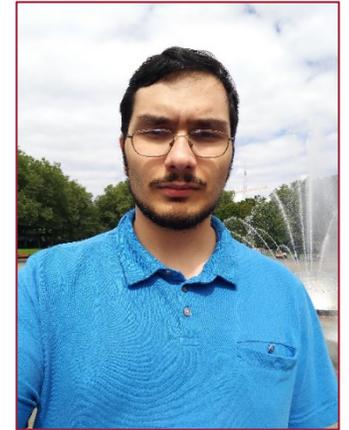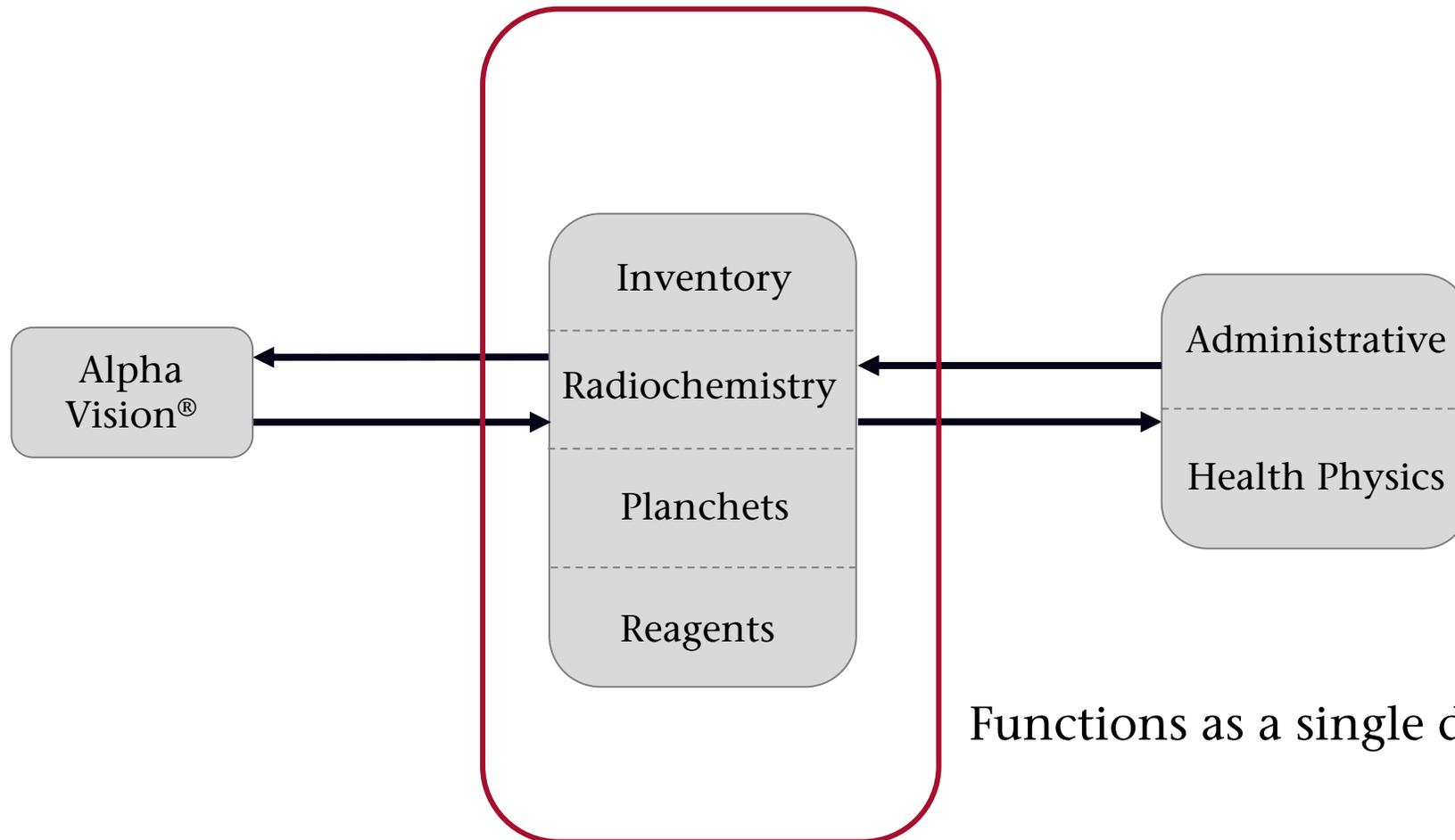 - ✓ Copying by hand

Our Vision: Before

Integrate THEMIS, Radiochemistry, Planchets, and Reagents databases...

Our Vision: After

...to create a Laboratory Information Management System (LIMS)

Alex Tabatadze

Alpha Vision®

Inventory

Radiochemistry

Planchets

Reagents

Administrative

Health Physics

Functions as a single database

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Roadmap: Building a LIMS

Inventory
1. Design new table structure for inventory tables
2. Build new tables in SQL
3. Import data from THEMIS to the new inventory tables
4. Design basic user interface
5. Test basic functionality

LIMS
6. Develop advanced functionality
7. Test advanced functionality
8. Prepare documentation

Design and Build New Table Structure in SQL

- Task 1 and 2: Completed

- However, we continue to make changes as we work with the data
  - ✓ E.g. Two new tables added for attaching files that are associated with case numbers and samples

- Enforces data integrity at the table level
  - ✓ Collection + Case combination
  - ✓ Dropdown menus

Import Data from THEMIS to New Inventory Tables

- Task 3: In progress
- 18 of 44 tables completed
  - ✓ Lists for dropdown menus
- 3 more complex tables in progress
  - ✓ Master sample list
  - ✓ Case No
  - ✓ Location
- 23 tables remain
  - ✓ Mostly new tables that did not exist in THEMIS
  - ✓ Need to be populated by hand

tbl_MASTER_SAMPLE_LIST

BARCODE	Autogenerated		PK
STATUS_ID	Autoint		FK
SAMPLE_TYPE_ID	Autoint		FK
NOTES	text	NULL	
DUMMY_INITIAL_MASS	float	NULL	
DUMMY_INITIAL_MASS_UNIT	FK_UNITS	NULL	
LOCATION_ID	autoint		FK
SEAL_TYPE_ID	Autoint		FK
FORMALIN_FIXED	bit		
DUMMY_CURRENT_MASS	Float	NULL	
ACID_TYPE_ID	Autoint	NULL	FK
CONTAINER_NO	char(10)	NULL	FK
DATE_ENTERED	datetime		
EMPLOYEE	varchar(50)		
PARENT_SAMPLE_NO	varchar(50)	NULL	
DUMMY_CURRENT_MASS_UNIT	FK(UNITS)	NULL	
SUBCONTAINER_NO	autoint	NULL	FK
PARENT_SAMPLE_BARCODE	8 digits	NULL	
CONC_TISSUE_DESCRIPTION	text		
BLANK	BLANK	NULL	
BLANK_1	BLANK	NULL	
HISTORIC_SAMPLE_NO	varchar(50)	NULL	
SPECIES_ID	autoint		FK
INITIAL_MASS_BALANCE_ID	Autoint	NULL	FK
BLANK_2	BLANK	NULL	
SAMPLE_SORT	varchar(50) (Mask)?		
SAMPLE_NO	varchar(50)		
CASE_NO_ID	Autoint		FK
TISSUE_DESCRIPTION_ID	Autoint		FK
MODIFIER_ID	Autoint		FK

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Challenges with Data Import

- Data structure has changed significantly
  - ✓ Pulling data from multiple THEMIS tables into a single new table
  - ✓ Parsing data from notes fields

- Interruptions such as creating a testing database, so that Elizabeth could start work on the user interface

Design User Interface

- Step 4: In progress

- 25 simple forms completed
  - ✓ Used to populate dropdown menus

- Design specifications outlined for two complex forms
  - ✓ New Container
  - ✓ Sample Login

Test Basic Form Functionality and SQL Tables

- Step 5: Initiated

- Minor issues identified when Elizabeth designed the dropdown menu forms

- Collections comments not importing correctly
  - ✓ Fixed

- Trailing spaces after dropdown list entries
  - ✓ In progress

New database

THEMIS

Advanced Functionality and Documentation

- Steps 6-8: Future

- Functionality that extends beyond an inventory database to a LIMS

- The ability to track changes in sample masses and associated sample types (tissue, ashed, acid solution, etc.)

- Automated data entry when the sample type changes
  - ✓ E.g. when an acid solution mass is entered, the sample type changes to "acid solution," the seal pack changes to a glass bottle, and the status changes to "storage"

Thank You!