

ARGroup

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Project Idea

We collaborated with Samantha Siu of the CGUI lab in the development and testing of her Making & Knowing application. The areas of help she requested was in testing of her application and designing of a test database in which the entire process of following a recipe and user's annotation at each step is readily available.

Database Architecture

Technologies

Google Cloud

MySQL

Unity



Google Cloud

MySQL®



Preprocessing annotation-metadata.csv

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T |
|----|---------------|-------------------------|-------------|----------------|-----------------|--|--|---|-------------------------|---------------------|-------------------|-------------------|----------------|--------------------------|--------------------------|---------|--------------------|------------------------|-------------------------------------|
| 1 | Annotation ID | Listing (folder na Year | | Semester | Theme | text_folder | annotation_file | UUID | GD_folder_ur | text_ur | thumbnail_ur | abstract_text_ur | file | Title | Author | Folios | Entry ID | abstract/bib crea | Present in log 20 Status 2018-10-10 |
| 2 | ann_999_fa_99 | "Stucco-example | 2099 Fall | Example | Text | _Stucco-ex: | AnnotationFall20 1Q_C732q9sfNS | https://drive.goo | https://drive.goo | https://drive.goo | https://drive.goo | https://drive.goo | Stucco-example | Editor, General | 029r | p029r_1 | | N - created 2018-10-10 | |
| 3 | ann_001_fa_14 | "Wax-Tallow," fol | 2014 Fall | Moldmaking and | Text | _Wax-Tallow AnnotationFall20 1307GL5qvGyY | https://drive.goo | https://drive.google.com/open?id=1307GL5qvGyYisflfCWTaHfhsfvN | Wax-Tallow | Cataldo, Visco | 109r | | p109r_1 | | Y | Y | | | |
| 4 | ann_002_fa_14 | "One-Sided Hollo | 2014 Fall | Moldmaking and | Text | _One-Sided AnnotationFall20 1K5vL_wtNCUW | https://drive.goo | https://drive.google.com/open?id=1K5vL_wtNCUW | One-Sided Hollo | Landsman, Rowi | 092r | | p092r_2 | | Y | Y | | | |
| 5 | ann_003_fa_14 | "Molded Roses," | 2014 Fall | Moldmaking and | Text | _Molded Rc AnnotationFall20 10_kJBrnJ67qrnV | https://drive.goo | https://drive.google.com/open?id=10_kJBrnJ67qrnVBYlw-E9ZnXkw | Molded Roses | Carlson, Katz | 129r | | p129r_4 | | Y | Y | | | |
| 6 | ann_003_fa_14 | "Molded Roses," | 2014 Fall | Moldmaking and | Text | _Molded Rc AnnotationFall20 10_kJBrnJ67qrnV | https://drive.goo | https://drive.google.com/open?id=10_kJBrnJ67qrnVBYlw-E9ZnXkw | Molded Roses | Carlson, Katz | 155r | | p155r_1 | | Y | Y | | | |
| 7 | ann_003_fa_14 | "Molded Roses," | 2014 Fall | Moldmaking and | Text | _Molded Rc AnnotationFall20 10_kJBrnJ67qrnV | https://drive.goo | https://drive.google.com/open?id=10_kJBrnJ67qrnVBYlw-E9ZnXkw | Molded Roses | Carlson, Katz | 155v | | p155v_1 | | Y | Y | | | |
| 8 | ann_004_fa_14 | "Original Pattern: | 2014 Fall | Moldmaking and | Annotation text | _ AnnotationFall20 1NnRe2CYpz5d | https://drive.goo | https://drive.google.com/open?id=1NnRe2CYpz5d9lbfm-fgMsdp07x | Original Patterns | Landsman, Rowen | | | | | | | N - Manually ent N | | |
| 9 | ann_005_fa_14 | "Molded Letter P | 2014 Fall | Moldmaking and | Text | _Molded Le Annotation_Fall20 180QnSFDjneEl | https://drive.goo | https://drive.google.com/open?id=180QnSFDjneElUpI_CvF1XvAFqv | Molded Letter P | Carlson, Katz | 131r | | p131r_2 | | Y | Y | | | |
| 10 | ann_006_fa_14 | "Calcined Oyster | 2014 Fall | Moldmaking and | Text | _Calcined Oysters," fol. 84v | (Cataldo, Visco) | https://drive.google.com/open?id=0BwJi-u8sfkVdfmhqN1REadBldfVFcP4V1FJaKpx | Calcined Oysters | Cataldo, Visco | 084v | | p084v_2 | | N - Manually ent N - M&K | | | | |
| 11 | ann_007_fa_14 | "Sulfur and Addit | 2014 Fall | Moldmaking and | Text | _Sulfur and AnnotationFall20 1RT9vZ5lct0x_6 | https://drive.goo | https://drive.google.com/open?id=1RT9vZ5lct0x_6BWifxC9qgh-YY | Sulfur and Addit | Landsman, Rowi | 140v | | p140v_1 | | Y | Y | | | |
| 12 | ann_007_fa_14 | "Sulfur and Addit | 2014 Fall | Moldmaking and | Text | _Sulfur and AnnotationFall20 1RT9vZ5lct0x_6 | https://drive.goo | https://drive.google.com/open?id=1RT9vZ5lct0x_6BWifxC9qgh-YY | Sulfur and Addit | Landsman, Rowi | 012r | | p012r_1 | | Y | Y | | | |
| 13 | ann_008_fa_14 | "Excellent Musta | 2014 Fall | Moldmaking and | Text | _Excellent M AnnotationFall20 1V0GLiYHerz-q | https://drive.goo | https://drive.google.com/open?id=1V0GLiYHerz-qm-oYf0z1_UkdIS4 | Excellent Mustar Mellon | | 048r | | p048r_3 | | Y | Y | | | |
| 14 | ann_009_fa_14 | "Magistry," fol. 84 | 2014 Fall | Moldmaking and | Text | _Magistry," AnnotationFall20 120KzyknBj-fr | https://drive.goo | https://drive.google.com/open?id=120KzyknBj-frmtfwc-YhiuFex1 | Magistry | Lee | 084r | | p084r_3 | | Y | Y | | | |
| 15 | ann_010_fa_14 | "Casting in a Box | 2014 Fall | Moldmaking and | Text | _Casting in AnnotationFall20 1aJDQ2p3EB8 | https://drive.goo | https://drive.google.com/open?id=1aJDQ2p3EB8GAVYsXuJwpc12 | Casting in a Box | Carlson, Katz | 118v | | p118v_1 | | Y | Y | | | |
| 16 | ann_011_fa_14 | "Sands and Bind | 2014 Fall | Moldmaking and | Text | _Sands and Binders," fol. 82r, 84v | (Cataldo, Vir) | https://drive.google.com/open?id=0BwJi-u8sfkVdfkxzVFN5a3h2T9SSGY4b0o5uVr | Sands and Binde | Cataldo, Visco | 082r | | p082r_3 | | N - Manually ent N - M&K | | | | |
| 17 | ann_011_fa_14 | "Sands and Bind | 2014 Fall | Moldmaking and | Text | _Sands and Binders," fol. 82r, 84v (Cataldo, Vir) | https://drive.google.com/open?id=0BwJi-u8sfkVdfkxzVFN5a3h2T9SSGY4b0o5uVr | Sands and Binde | Cataldo, Visco | 084v | | p084v_2 | | N - Manually ent N - M&K | | | | | |
| 18 | ann_012_fa_14 | "Ox Bone and Rx | 2014 Fall | Moldmaking and | Annotation text | _ AnnotationFall20 10E-vuGwO1-2L | https://drive.goo | https://drive.google.com/open?id=10E-vuGwO1-2L3HDVwx5AQmHc | Ox Bone and Ro Wang | | 089r | | p089r_1 | | N - Manually ent N | | | | |
| 19 | ann_013_sp_15 | "Too Thin Things | 2015 Spring | Moldmaking and | Text | _Too Thin T AnnotationSpring 1sLUY560pxL5 | https://drive.goo | https://drive.google.com/open?id=1sLUY560pxL5MUbg16d7884xb1t | Too Thin Things | Fu, Zhang | 142v | | p142v_1 | | Y | Y | | | |
| 20 | ann_014_sp_15 | "Founders of Sm | 2015 Spring | Moldmaking and | Text | _Founders i AnnotationSpring 1H1XkpYLArFco | https://drive.goo | https://drive.google.com/open?id=1H1XkpYLArFco12WsPfipBMut | Founders of Smes | Chiostriini, Palfra | 080v | | p080v_1 | | Y | Y | | | |
| 21 | ann_015_sp_15 | "Imitation Coral," | 2015 Spring | Moldmaking and | Text | _Imitation C AnnotationSpring 1aBY9sBN6VMx | https://drive.goo | https://drive.google.com/open?id=1aBY9sBN6VMxG5UQ2Ai3f6zB15 | Imitation Coral | Chessa | 003r | | p003r_1 | | Y | Y | | | |
| 22 | ann_016_sp_15 | "Alabaster Sand, | 2015 Spring | Moldmaking and | Text | _Alabaster i AnnotationSpring 142Gq18r10daBOArTkg6d02WF | https://drive.goo | https://drive.google.com/open?id=142Gq18r10daBOArTkg6d02WF | Alabaster Sand | Gans | 083r | | p083r_6 | | Y | Y | | | |
| 23 | ann_017_sp_15 | "Sugar Casting," | 2015 Spring | Moldmaking and | Text | _Sugar Cas AnnotationSpring 19hU-U8HcOJqJg | https://drive.goo | https://drive.google.com/open?id=19hU-U8HcOJqJgSHUPq5W17H0TBg | Sugar Casting | Durkin | 126r | | p126r_1 | | Y | Y | | | |
| 24 | ann_018_sp_15 | "Knowledge Excl | 2015 Spring | Moldmaking and | Text | _Knowledge AnnotationSpring 1XmoVIeAln5ub | https://drive.goo | https://drive.google.com/open?id=1XmoVIeAln5ubC2XlGZQ9JAnr | Knowledge Exch Gans | | 128v | | p128v_1 | | N - Manually ent N | | | | |
| 25 | ann_019_sp_15 | "Varnish for Lute: | 2015 Spring | Moldmaking and | Text | _Varnish for AnnotationSpring 1MvCkw-O3gfIG | https://drive.goo | https://drive.google.com/open?id=1MvCkw-O3gfIG2FmEBxC3mkvN | Varnish for Lutes | Marris, Pope | 098r | | p098r_1 | | Y | Y | | | |
| 26 | ann_020_sp_15 | "Ox Bone, Wine, | 2015 Spring | Moldmaking and | Text | _Ox Bone, \ AnnotationSpring 1BETVlbdM5pBr | https://drive.goo | https://drive.google.com/open?id=1BETVlbdM5pBrCzIzb9bPj3v_hij | Ox Bone, Wine, i | Marris, Pope | 084v | | p084v_1 | | Y | Y | | | |
| 27 | ann_021_sp_15 | "Powder for Hour | 2015 Spring | Moldmaking and | Text | _Powder for AnnotationSpring 1xsKy_5wTQ0T_MFow2Vg2vL2Sw | https://drive.goo | https://drive.google.com/open?id=1xsKy_5wTQ0T_MFow2Vg2vL2Sw | Powder for Hour | Pope | 010r | | p010r_5 | | N - Manually ent N - M&K | | | | |
| 28 | ann_022_sp_15 | "Whalebone & Bone | 2015 Spring | Moldmaking and | Text | _Whalebone & AnnotationSpring 14_mwV1 mother https://drive.google.com/open?id=14_mwV1_mother_bone https://drive.google.com/open?id=14_mwV1_mother_bone | https://drive.goo | https://drive.google.com/open?id=14_mwV1_mother_bone | Whalebone & Bone | Chiostriini, Palfra | 155r | | p155r_4 | | v | v | | | |

Construction of notes.csv

| | A | B | C | D | E | F |
|---|--------------|--------------|---|-----------------|---------------------|--------------------------------|
| 1 | note_ID | content_type | content | coordinates | timestamp | rotation |
| 2 | note_04_26_1 | photos | https://drive.google.com/file/d/11TB5Nd0ND4N7QaCPIFxechD3NjloxqjT/view?usp=sharing | (0.0, 0.5, 5.2) | 2019_04_26_13:37:06 | (1.0, 2.0, 3.0, 4.0) |
| 3 | note_04_26_2 | text | hello world | (1.4, 1.7, 1.5) | 2019_04_26_13:37:36 | (1.53, 9.27, 2.6534, 8.223) |
| 4 | note_04_26_3 | videos | https://drive.google.com/file/d/1ghYNGe1pFI7CNK4X-Slc0E2lo9C9prlx/view?usp=sharing | (4.6, 2.5, 3.3) | 2019_04_26_13:38:06 | (4.723, 2.236, 7.234, 4.73453) |
| 5 | | | | | | |

Building the Tables

- Converted annotation-metadata.csv and notes.csv into SQL tables

| Column | Datatype | PK | NN | UQ | BIN | UN | ZF | AI | G | Default / Expression |
|-----------------|--------------|-------------------------------------|-------------------------------------|----|-----|----|----|----|---|----------------------|
| annotation_id | VARCHAR(15) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | | | | NULL |
| folder_name | VARCHAR(200) | | | | | | | | | NULL |
| Year | YEAR(4) | | | | | | | | | NULL |
| Semester | VARCHAR(6) | | | | | | | | | NULL |
| Theme | VARCHAR(100) | | | | | | | | | NULL |
| text_folder | VARCHAR(200) | | | | | | | | | NULL |
| annotation_file | VARCHAR(200) | | | | | | | | | NULL |
| UUID | VARCHAR(60) | | | | | | | | | NULL |
| GD_folder_url | VARCHAR(200) | | | | | | | | | NULL |
| GD_text_url | VARCHAR(200) | | | | | | | | | NULL |
| thumbnail_url | VARCHAR(200) | | | | | | | | | NULL |
| abstract_text | VARCHAR(200) | | | | | | | | | NULL |

Column details 'annotation_id'

| | | | |
|---|--|-----------------------------------|-------------|
| Column Name: | annotation_id | Datatype: | VARCHAR(15) |
| Charset/Collation: | utf8 | Default Collation: | |
| Comments: | | | |
| Storage: | <input type="radio"/> VIRTUAL | <input type="radio"/> STORED | |
| <input checked="" type="checkbox"/> Primary Key | <input checked="" type="checkbox"/> Not NULL | <input type="checkbox"/> Unique | |
| <input type="checkbox"/> Binary | <input type="checkbox"/> Unsigned | <input type="checkbox"/> ZeroFill | |

Building the Tables

- Uploaded each table to the database

Bucket details EDIT BUCKET REFRESH BUCKET

annotation-metadata

Objects Overview Permissions Bucket Lock

Upload files Upload folder Create folder Manage holds Delete

Filter by prefix...

Buckets / annotation-metadata

| <input type="checkbox"/> | Name | Size | Type | Storage class | Last modified | Public access | Encryption | Retention | Expiration date | Holds | ⋮ |
|--------------------------|-------------------------------------|----------|--------------------------|----------------|---------------------------|---------------|--------------------|-----------|-----------------|-------|---|
| <input type="checkbox"/> | annotation-metadata - Sheet1.csv | 67.77 KB | text/csv | Multi-Regional | 4/24/19, 3:11:50 PM UTC-4 | Not public | Google-managed key | – | None | None | ⋮ |
| <input type="checkbox"/> | annotation_annotation-metadata0.sql | 74.99 KB | application/octet-stream | Multi-Regional | 4/24/19, 3:36:46 PM UTC-4 | Not public | Google-managed key | – | None | None | ⋮ |
| <input type="checkbox"/> | notes_notes - sheet1.sql | 2.49 KB | application/octet-stream | Multi-Regional | 4/26/19, 1:56:04 PM UTC-4 | Not public | Google-managed key | – | None | None | ⋮ |
| <input type="checkbox"/> | notes_notes.sql | 2.42 KB | application/octet-stream | Multi-Regional | 4/26/19, 2:07:09 PM UTC-4 | Not public | Google-managed key | – | None | None | ⋮ |

Building the Tables

- Tested if we can retrieve data from annotation-metadata table

```
Database changed
MySQL [annotations]> select annotation_ID from annotationmetadata;
+-----+
| annotation_ID |
+-----+
| ann_004_fa_14 |
| ann_057_sp_17 |
| ann_066_fa_18 |
| ann_069_fa_18 |
| ann_072_fa_18 |
| ann_075_fa_18 |
| ann_015_sp_15 |
| ann_055_sp_17 |
| ann_071_fa_18 |
| ann_034_sp_16 |
| ann_052_fa_16 |
| ann_070_fa_18 |
| ann_056_sp_17 |
| ann_054_sp_17 |
| ann_021_sp_15 |
| ann_028_fa_15 |
```

Building the Tables

- Tested if we can retrieve data from and write data to notes table

```
Database changed
```

```
MySQL [annotations]> INSERT INTO notes VALUES('note_04_29_1', 'text', 'this is my note', '(1.4, 1.7, 1.5)', '2019_04_29_13:37:36', '(1.53, 9.27, 2.6534, 8.223)');  
Query OK, 1 row affected (0.01 sec)
```

```
MySQL [annotations]> █
```

Testing in Unity

User Testing

Persona 1: Tianna (Researcher in the M&K Lab)

- Reconstruct a dry flower following the steps indicated on folios 120v-121r in Ms. Fr. 640.
 - Take photos
 - Write annotations
 - Create a replicable process



Problems & Solutions for Persona 1

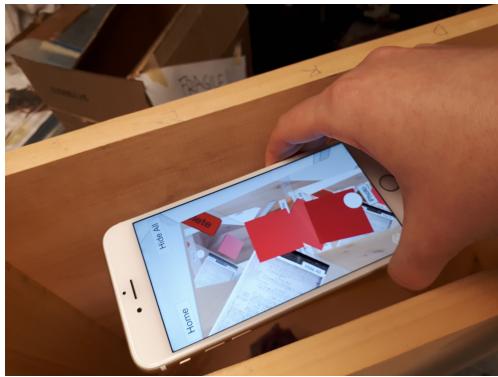


Figure 1

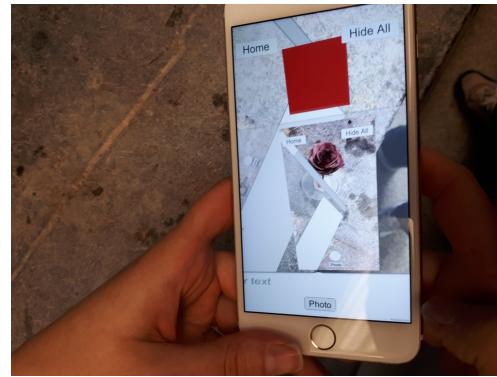


Figure 2

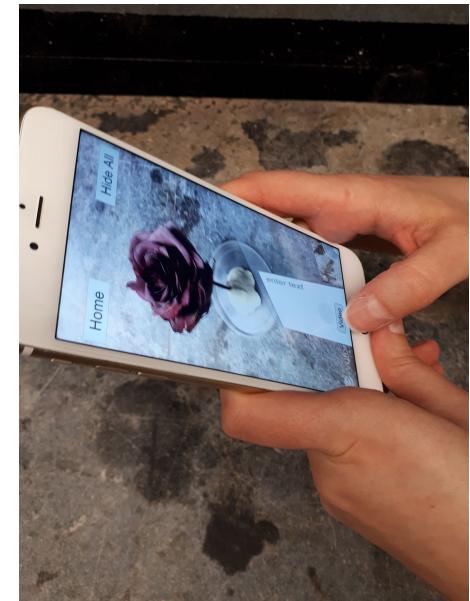


Figure 3

Persona 2: Taewan (Student in the M&K Lab)

- Understand and ultimately replicate the process previously done by Tianna
 - Red boxes (photos and annotations) are scattered all over the space
 - Move around to find each and every red box



Problems & Solutions for Persona 2

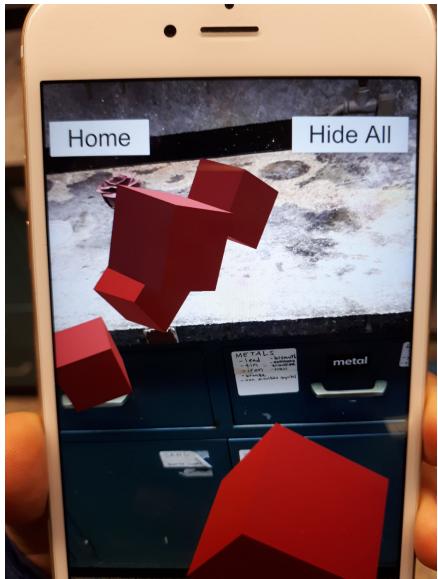


Figure 4

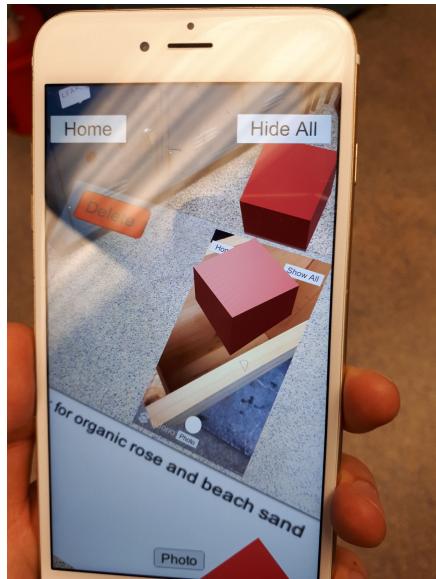


Figure 5



Figure 6

Persona 3: Mark (Reader of Ms. Fr. 640 not in NYC)

- Due to the lack of proximity from the M&K Lab, Mark wishes to learn more about and virtually experience the process of drying a flower (folios 120v-121r) by using Sam's application downloaded on his iPhone
 - Use database and cloud directly linked to the app
 - Follow instructions laid out by Tianna



Problems & Solutions for Persona 3

- ***Cloud and database storage is not an available function yet
 - Multiple potential bugs related to connection with the database
- Similar problems founded by Persona 2
 - Not a reader-mode text box
 - Difficult positioning
 - Zoom-in and zoom-out function needed

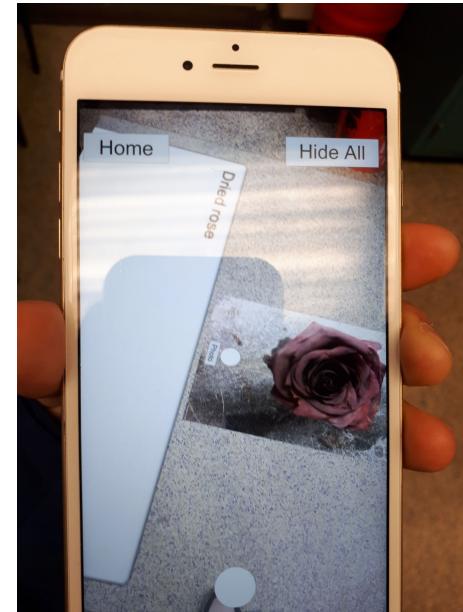


Figure 7

Thank You!