

Pilot Project: Using Lucidchart to Complete Assignments in CIS Courses

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About Lucidchart:

Lucidchart (lucidchart.com) is browser-based diagramming software, similar in function to Microsoft Visio (see <https://medium.com/techmintle/lucidchart-vs-visio-a-review-features-and-pricing-d75166b33345> for a comparison). The general consensus among evaluators is that Lucidchart is more user-friendly than Visio. CIS students have been using Lucidchart for various assignments for several semesters already. Lucidchart allows them to create many different types of diagrams in addition to flowcharts. Some of the technical diagrams such as database ER Diagrams can be exported directly to code. For example, students in database classes such as CIS 252, CIS 417, and CIS 489 are able to design their database in Lucidchart, and then export the code to be copied to the database instance.

Advantages of Lucidchart I have found include:

- It is browser-based, so students can access it through any computer lab, or at home
- Ease of use. The user-interface is very intuitive.
- The number of templates available extend beyond technical diagrams. There are education templates for concept maps of all kinds, flow charts, timelines, business processes, project management, etc.

Project Goals and Justification:

With Lucidchart students in CIS classes are able to complete hands-on activities that help to increase their understanding of the subject matter, and also to work on projects based on the diagrams they create. As mentioned before, students in various CIS classes can use Lucidchart to create diagrams and project documentation.

- In CIS 252, Database Design I, design their own databases and then implement them in a DBMS. Students may then use the database in other projects such as web applications.
- Students in CIS 327 Cloud Computing work with real-world tools to complete assignments. Students in and CIS 489 System Analysis and Design II work with outside employers to complete IT projects. They make use of Lucidchart to complete the project documentation.
- Students in CIS 488 Capstone may also use Lucidchart to create their Capstone Project Documentation.
- Lucidchart does have a free tier available to students with a .edu address, but the number of diagrams they can create is limited to 3. Students in courses such as CIS 252 or CIS 489 as well as other courses often need to create more diagrams. A diagram can be downloaded to open up space for another, but the downloaded document cannot be edited.
- Also students are not given access to all the templates in the free tier. Having an enterprise account gives students, many more options.
- Students subscriptions cover 2 semesters of courses required for the major.

Materials

Lucidchart Education Enterprise Licenses- 40 @ 45.00 each (1800 total)
Assignments created by course instructor.

Assignments:

Students in CIS classes were given assignments that allowed them to use Lucidchart to create diagrams and documentation for student projects. The assignments included:

CIS 112:

Floor Plan Assignment: Learning objective:

5. Describe the importance of information security based on needs for personal security on a network or on a private workstation or a mobile device.

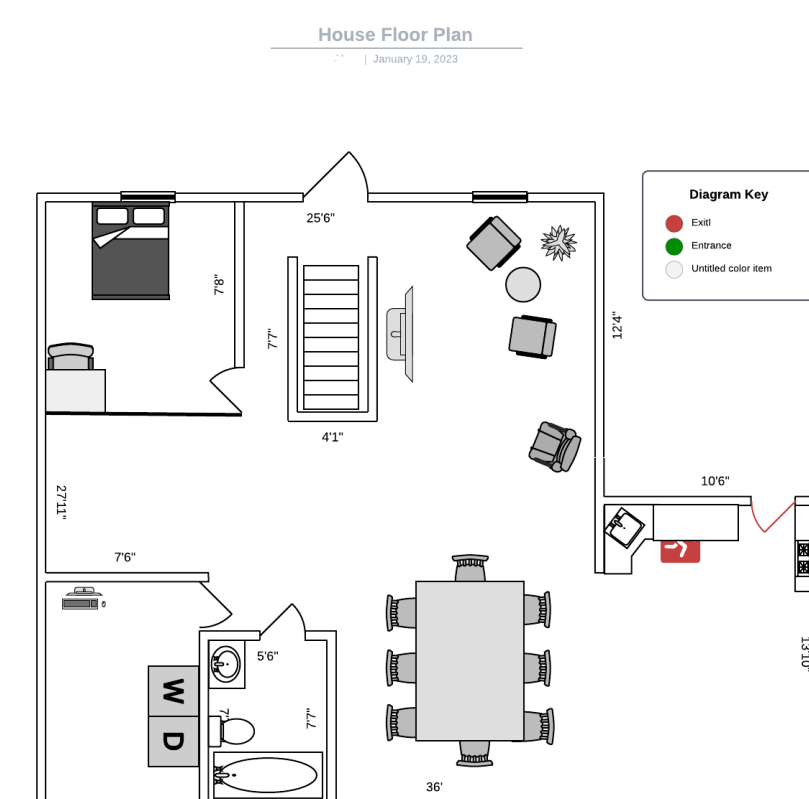
This was done as part of a unit on Perimeter Security. We watched a video about physical penetration testing where the tester was seeing how could get past security controls to enter a building. We then examined the security of the computer lab in Academy Hall. The assignment was to assess the security of their home or living space.

Students were instructed to create a floor plan diagram using Lucidchart showing all possible points of entry, and then describe any security measures such as locks, alarm systems, etc.

Instructions:

Create a diagram at <https://www.lucidchart.com/pages/> (instructions are in the video) of your current living space or house. Include ALL possible points of entry. Then write a paragraph or two describing how you secure the boundaries when you are not present and submit under a separate link.

Example of Student Work:



CIS 252:

Database Design Project:

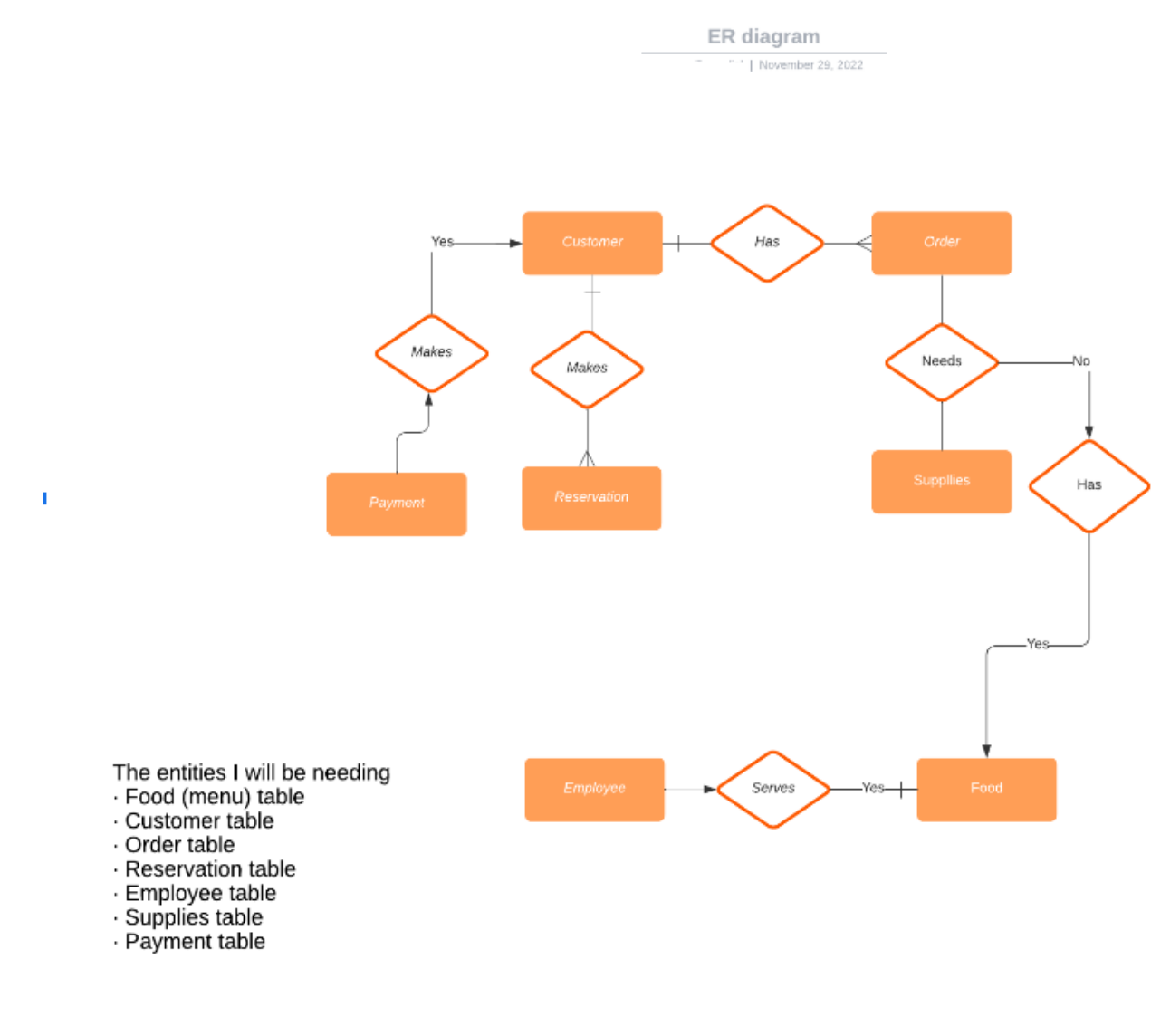
Learning objective:

2. Discuss the business rules applied to database design and management.
3. Describe database concepts used for database planning and architecture.

With this project, students created a design for a database based on a business case they developed. They completed all steps of the design process, ending with a completed database.

After examining their business case, and creating a list of entities and relationships to be modeled in their database, students were instructed to create a Chen ER diagram showing the relationships between the entities.

Example of Student Work:



CIS 489:

Website Design Project:

Learning objective:

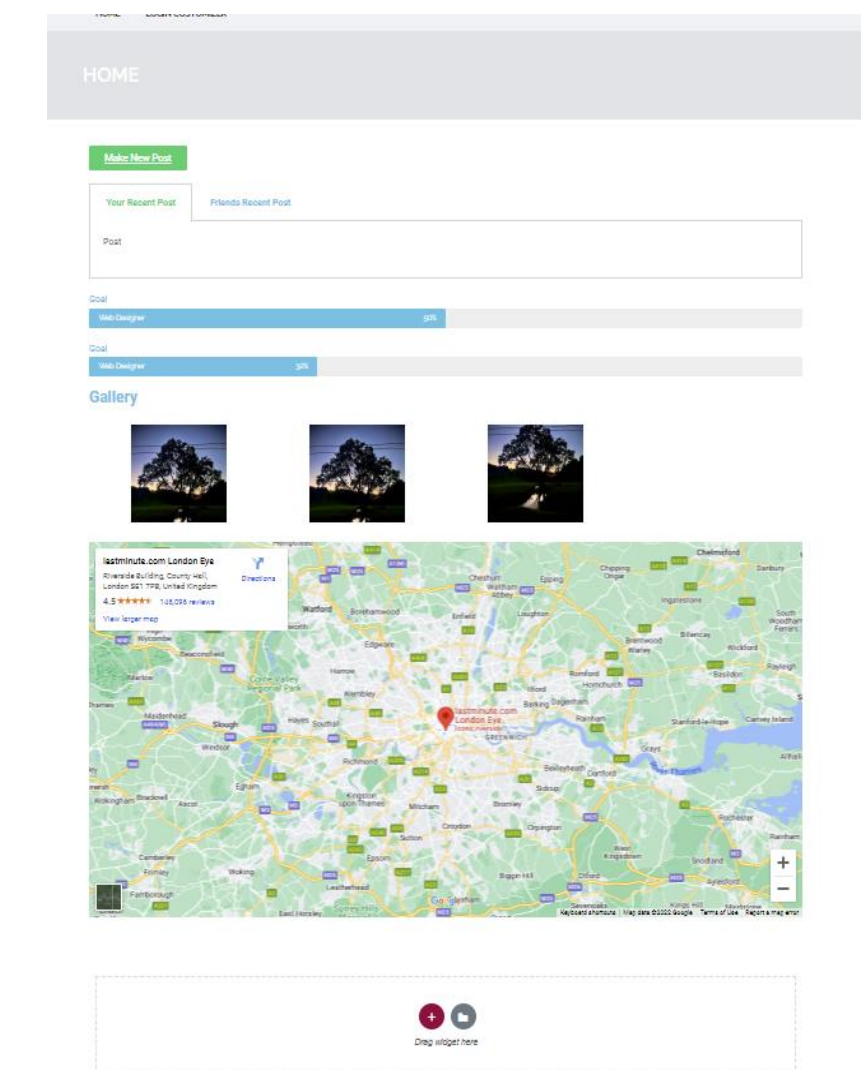
3. Design application system solutions to meet the needs identified and document the design in requirements, specifications and design documents

Students in the class worked on a group project to develop a technological solution in collaboration with a local business.

Students began by interview the client about their requirements, and then worked with the client to develop a solution. The objective of the course was to complete the requirements documentation for the project, and possibly to begin the implementation phase.

The solution that the students developed in this example was to create a wordpress website, for a personal social media app. Students used Lucidchart to create wireframes for the website.

Example of Student Work:



Conclusion and Recommendations:

The assessment of the learning outcomes showed a positive correlation between the use of Lucidchart, and achievement of learning outcomes. In these courses and others, students were able to use a number of Lucidchart templates, to visualize concepts, create requirements diagrams for software design, and even create ER diagrams for databases that could be directly exported to SQL code used for database creation. We have only begun to explore the possible applications for Lucidchart. One of the biggest advantages of Lucidchart is that it is browser-based, so that the students can access it outside of University computer labs, and there is no concern about compatibility with devices.

The plan is to carry on using Lucidchart for CIS courses and also explore further applications. One of our instructional goals is to develop students' critical-thinking skills and their experience with technology concepts and being able to illustrate concepts and then create diagrams is very helpful. Students also gain valuable hands-on experience creating design documentation.

I can see many additional applications for this software.

Acknowledgements:

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