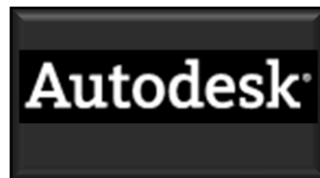


AutoCAD LT 2010 Productivity Study: A white paper presenting the results

Conducted for



By:



August 31, 2009

AutoCAD LT 2010 Increases Productivity by 36% Over AutoCAD LT 2007

Burke Inc., an independent market research and consulting firm, compared engineers and designers with Architecture, Mechanical, and Civil backgrounds on how much time it took them to complete a series of six tasks using AutoCAD LT 2010 and AutoCAD LT 2007. One group of nine users completed the tasks using AutoCAD LT 2010 and the other group of twelve users completed the same set of tasks using AutoCAD LT 2007.

The time required to record a task as completed was captured through the use of a timer application users started and stopped at the completion of a task. The timer allowed users to pause the timer if required for help or if they needed to use the help function. The completed tasks were also evaluated for accuracy and completeness by the AutoCAD LT technical expert. Not all users completed all of the assigned tasks within the time frame and not all users completed the tasks accurately or with all of the task elements completed.

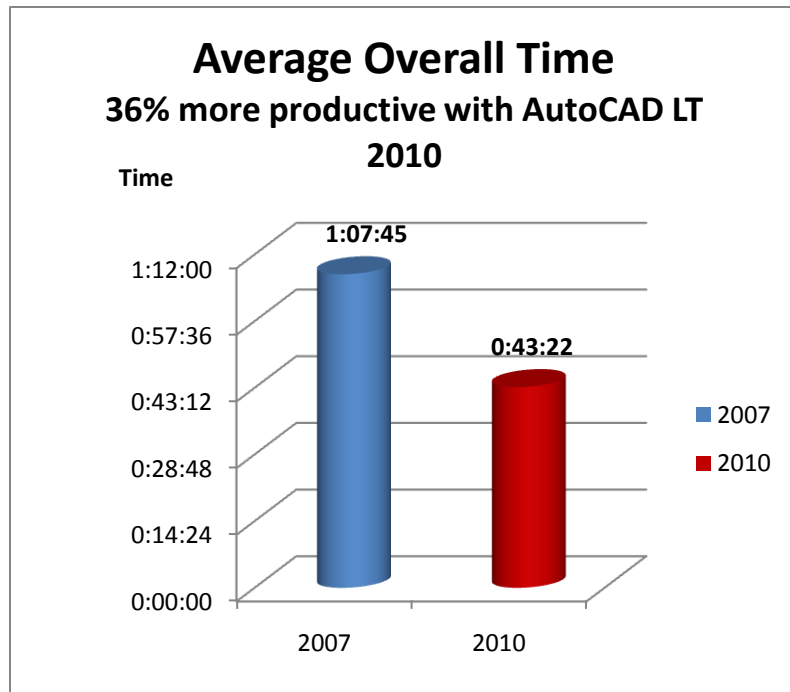
The findings were clear: **AutoCAD LT 2010 is more productive.**

- **AutoCAD LT 2010**

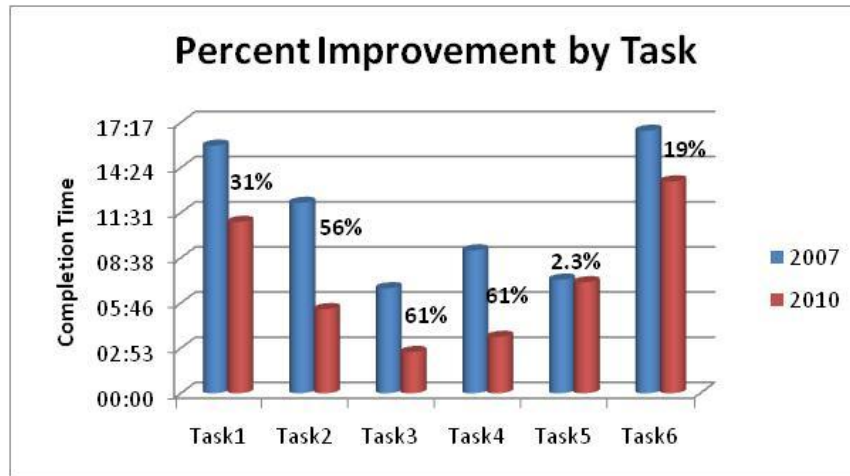
- Allows Tasks to be Completed Quicker Overall:**

- Users were able to complete the set of 6 assigned tasks quicker than those completing an identical set of tasks using AutoCAD LT 2007. Those using AutoCAD LT 2010 were able to complete the assigned tasks in

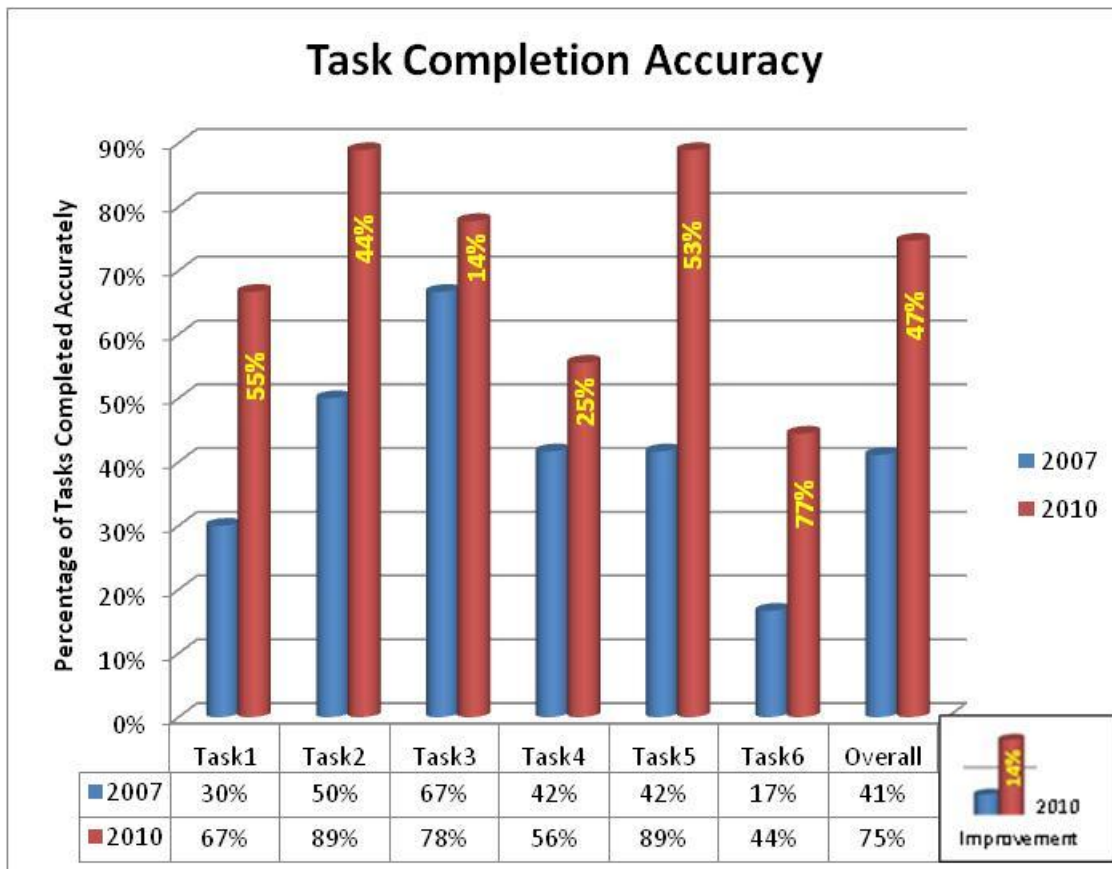
- about two-thirds the time of their 2007 counterparts (average of 43 minutes for 2010 versus 67 minutes for 2007).



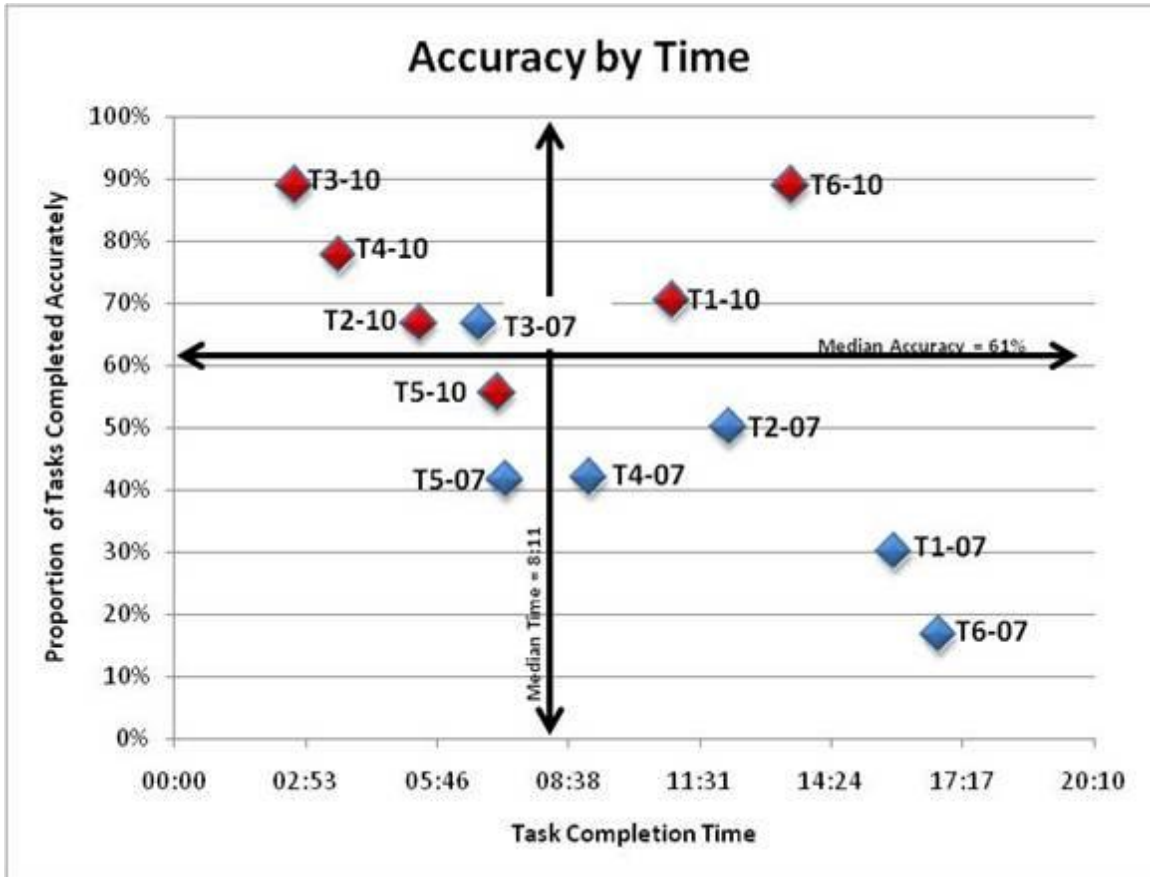
- AutoCAD LT 2010 Allows Individual Tasks to be Completed Quicker:**
 Productivity gains varied by task but in all tasks except one, time savings were substantial.



- AutoCAD LT 2010 Allows Individual Tasks to be Completed With Less Error:** As a group, those using AutoCAD LT 2010 were able to complete all six tasks with a higher level of completion accuracy than those using LT 2007.



- Combining Time and Completion Accuracy illustrates conclusively that AutoCAD LT 2010 is superior to AutoCAD LT 2007:** Half of the LT 2010 tasks were completed in the fastest, most accurate Time X Accuracy quadrant while two-thirds of the LT 2007 tasks were performed in the slowest, least accurate quadrant.



The results are compelling: AutoCAD LT 2010, with its new commands and interface, allows users to increase productivity by reducing the time required to complete tasks while reducing losses due to correction and time spent proofing their work.

Individual Task Results

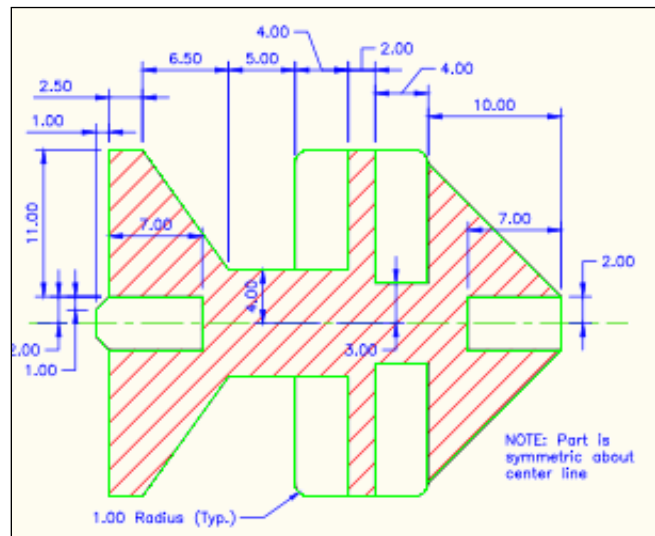
Six individual tasks were assigned to each user. These are described as follows.

Task 1: Recreate Drawing From PDF

Users in Task 1 were provided a PDF file of a drawing and asked to replicate the drawing using their assigned version of AutoCAD LT.

Steps

1. Use standard AutoCAD LT commands (line, polyline, arc, circle, etc.) to recreate the drawing.
 - a. Do NOT include text or dimensions. These are provided for reference only.
 - b. It is not necessary to hatch the object.



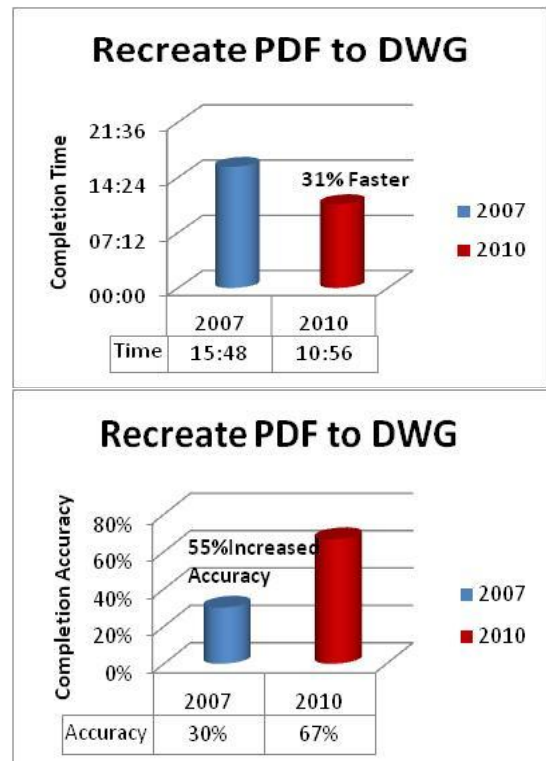
Study Results

AutoCAD LT 2010 users were significantly faster and more accurate than those using LT 2007.

LT 2010 users were able to use the Attach command to attach the PDF file to the DWG and then, using common AutoCAD LT tools, trace the object and save as a DWG.

In contrast AutoCAD LT 2007 users committed many errors in the final dimensions or omitted elements of the drawing.

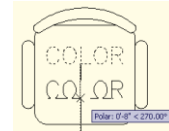
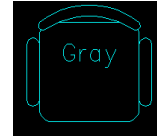
Conclusion: Overall, AutoCAD LT 2010 users were a third faster and twice as accurate as AutoCAD LT 2007 users in completing the drawing.



Task 2: Add An Attribute To A Block Definition

In this task, users were directed to add an attribute to an existing block definition and update all existing block instances.

1. Open the drawing.
2. Select a Chair block.
3. Right-click on the block and choose Block Editor.
4. Copy the COLOR attribute 8" down (towards the front of the chair).
5. Double-click on the *new* attribute.
 - a. Change the Tag to PRICE
 - b. Change the Prompt to "Chair Price"
 - c. Change the Default to "\$600"
6. Close the Block Editor and save your changes.
7. Replace each instance of the block with the new definition. Be sure to enter the existing attribute information in the new block.
 - a. **NOTE:** There are 16 blocks total to update.

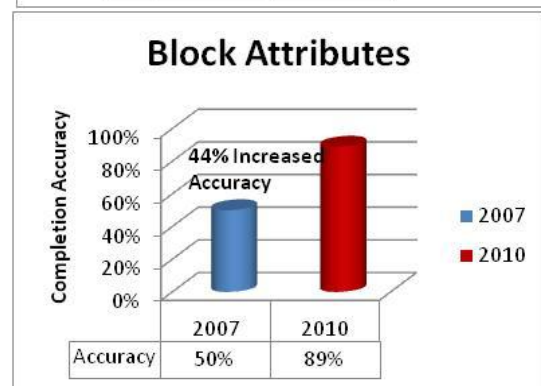
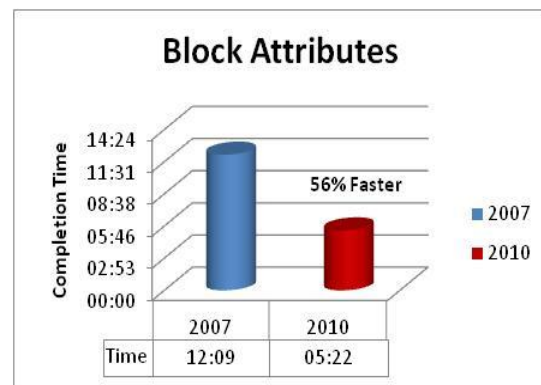


Study Results

AutoCAD LT 2010 users were able to more quickly and accurately edit block information and then have the information automatically updated by *syncing* the information for all of the blocks. All but one relatively inexperienced LT 2010 user completed this task accurately.

In contrast, LT 2007 users were required to modify the block information and then copy it to each block individually. They took twice as long to finish the task with only half of the users completing it accurately.

Conclusion: AutoCAD LT 2010 offers tools that can reduce time and error when completing repetitive tasks.

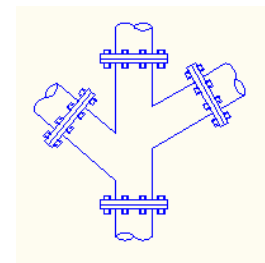
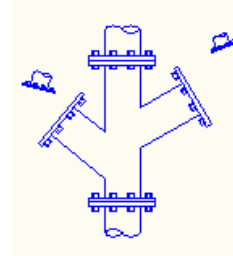


Task 3: Align Objects

In this exercise, users aligned new pipe ends with the ends of an existing pipe.

Steps

1. Open the drawing.
2. Align the two "floating" pipe ends with the ends of the multi-ended pipe. Be sure to match the size and rotation of the existing ends.

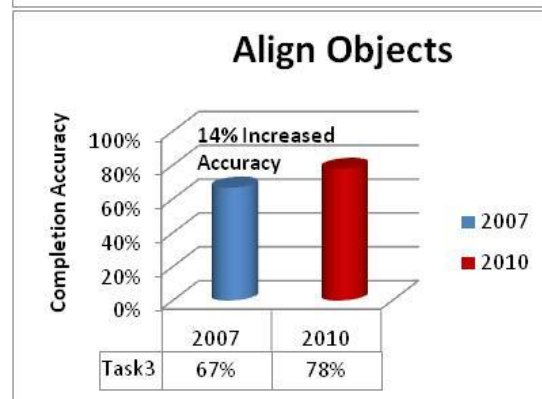
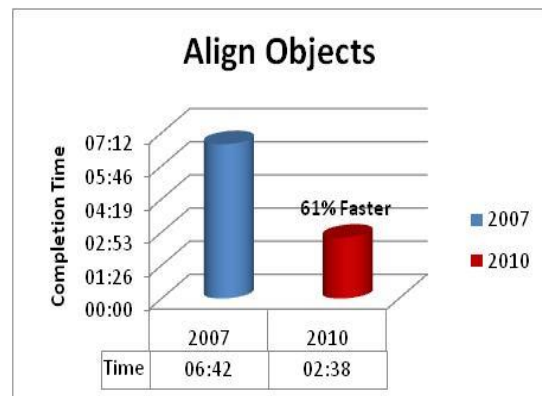


Study Results

This exercise demonstrates that using new features found in AutoCAD LT 2010 can greatly increase productivity over LT 2007.

Using the *Align* command, LT 2010 users were able to use very few steps to quickly and accurately place the pipe ends in place. Overall they were able to complete the task much faster than those using LT 2007. Note that many AutoCAD LT 2010 users were not aware of the *Align* command. After a short time they were shown the command and quickly finished the task. Their combined time includes the initial time they spent trying to understand the *Align* command which suggests that more familiarity with AutoCAD LT 2010 will produce even greater gains over LT 2007.

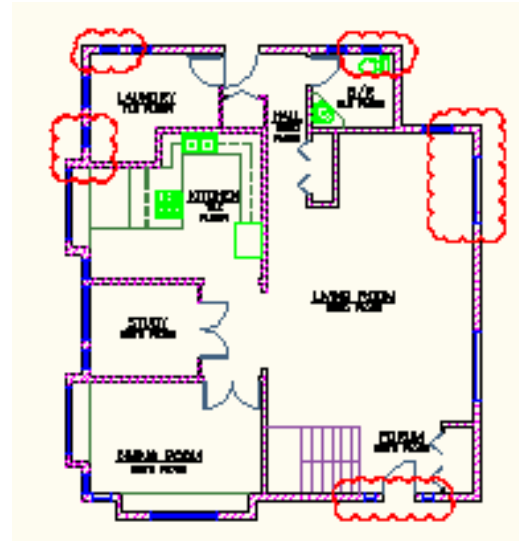
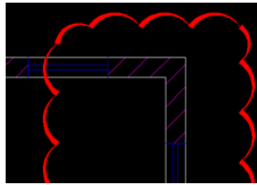
Conclusion: AutoCAD LT 2010 offers the opportunity to increase productivity based purely on features designed to decrease the time required to complete drawing tasks.



Task 4: Edit Hatch Objects

Users modified the size and shape of existing hatch objects in this task.

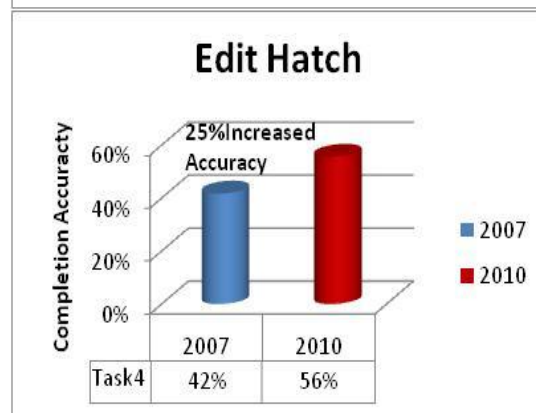
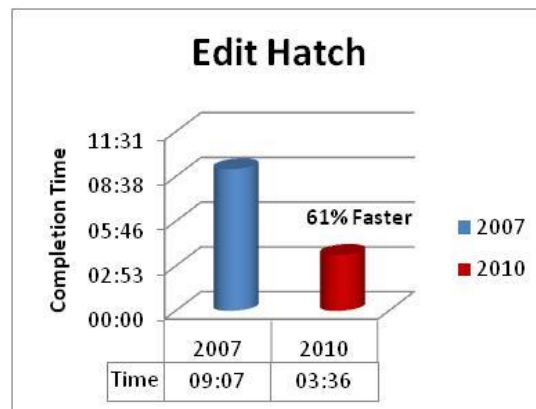
1. Open the drawing.
2. Adjust the wall hatching so that it aligns with the new positions of the windows.
 - a. Areas that need to be modified have been circled with revision clouds.



Study Results

AutoCAD LT 2010 users were able to use new features to reduce completion time and errors when editing hatches in drawings. With LT 2010 users can now “grab” hatches and stretch them into the desired locations. AutoCAD LT 2007 users did not have the ability to stretch hatches or to reposition them into the desired locations and as a result had to rely on the older, more cumbersome process that took more time and led to a greater number of completion errors.

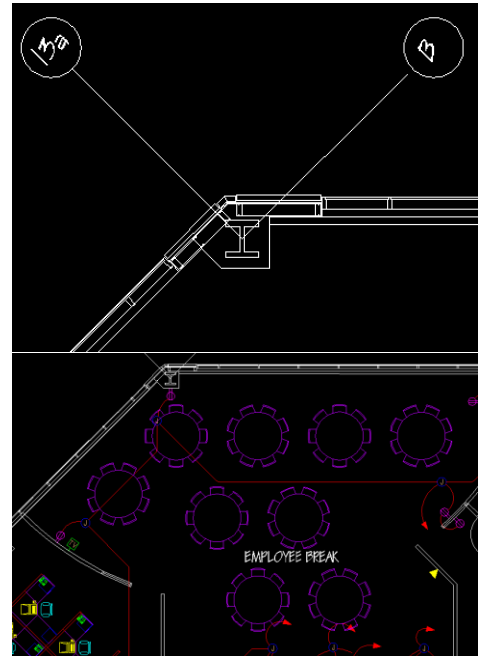
Conclusion: The *Stretch* command feature allowed LT 2010 users to complete the task with 25% improvement in completion errors and considerably faster than those using AutoCAD LT 2007.



Task 5: Open and Edit External References

In this task users opened an external reference and added geometry to it from its host drawing.

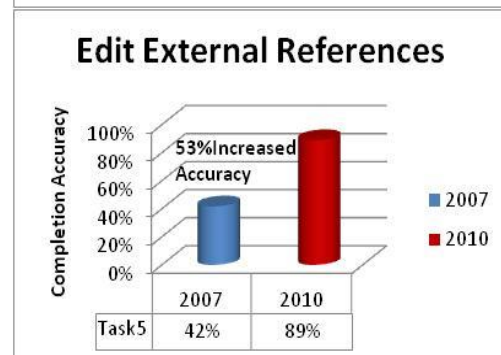
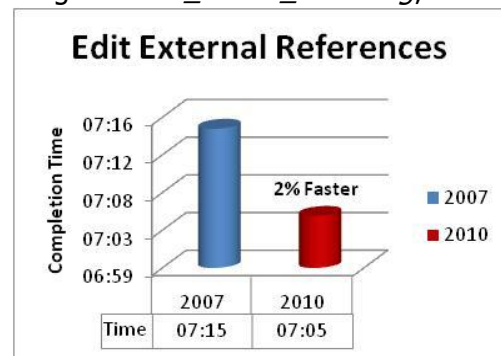
1. Use the External References Manager to identify the location of *x_Floor_Plan.dwg*.
 - a. Open the file using Windows Explorer or the Open command.
2. Rename grid line 13a to 13.1.
3. Save and close *x_Floor_Plan.dwg*.
4. Return to *05_Power_Plan.dwg* and reload *x_Floor_Plan.dwg* from the External References Manager to display your changes.
5. Use the External References Manager to identify the location of *x_Furniture_Plan.dwg*.
 - a. Open the file using Windows Explorer or the Open command.
6. Transfer the 9 tables in the Employee Break room from *05_Power_Plan.dwg* to *x_Furniture_Plan.dwg*.
7. Close *x_Furniture_Plan.dwg*, saving your changes. In *05_Power_Plan.dwg*, reload *x_Furniture_Plan.dwg* from the External References Manager.



Study Results

Many of those participating in the study were unfamiliar with the use of external references. As a result, users of AutoCAD LT 2010 and AutoCAD LT 2007 took about the same amount of time to complete the task. However, AutoCAD LT 2010 users were able to complete the task with twice the accuracy of those using LT 2007.

Conclusion: These results suggest that those interested in staying at the top of their skill level will find features and benefits in AutoCAD LT 2010 that are consistent with their own professional goals.



Task 6: Add Dimensions to Multiple Views at Varying Scales

In this task multiple dimensions were added to a drawing in AutoCAD LT. These dimensions were to be displayed in multiple viewports and at different scales.

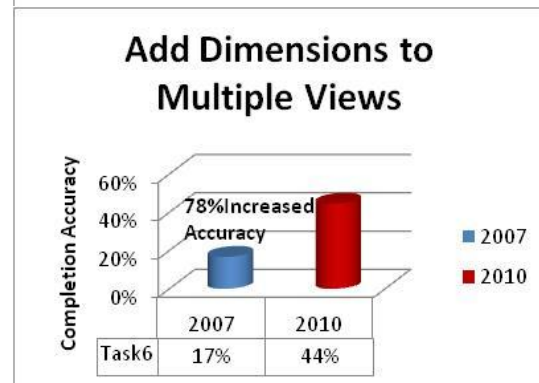
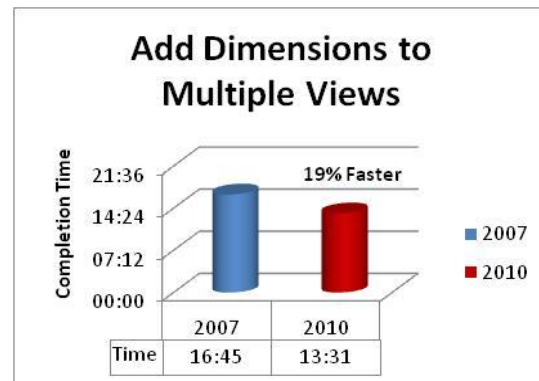
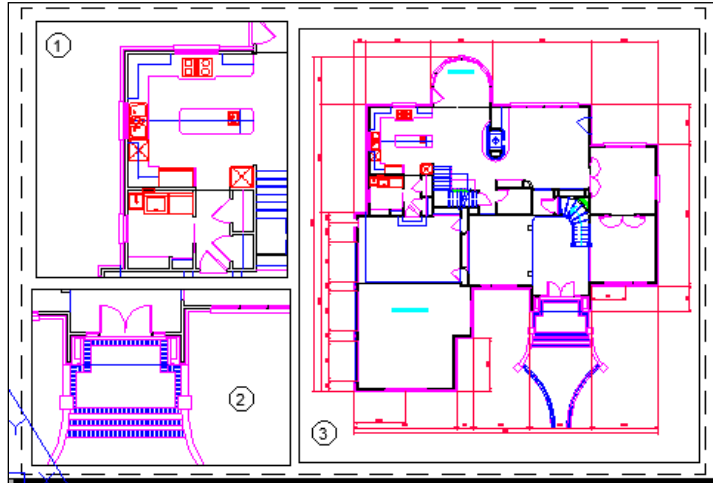
1. Open the file.
2. Add dimensions to the floor plan until it matches the finished viewports.

Study Results

This task was very step intensive requiring users of both versions of the software to take multiple actions to complete the task. Overall, AutoCAD LT 2010 allowed users to complete the task almost 20% faster than those using LT 2007.

Users in both groups struggled to accurately complete the task. LT 2010 users were only 44% accurate with their finished products. However this was 78% more accurate than those using LT 2007 who were able to achieve only a 17% completion accuracy level.

Conclusion: AutoCAD LT 2010 facilitates complex projects. While both user groups struggled to complete the task, the results show that AutoCAD LT 2010 users were better able to complete the project accurately and quickly.



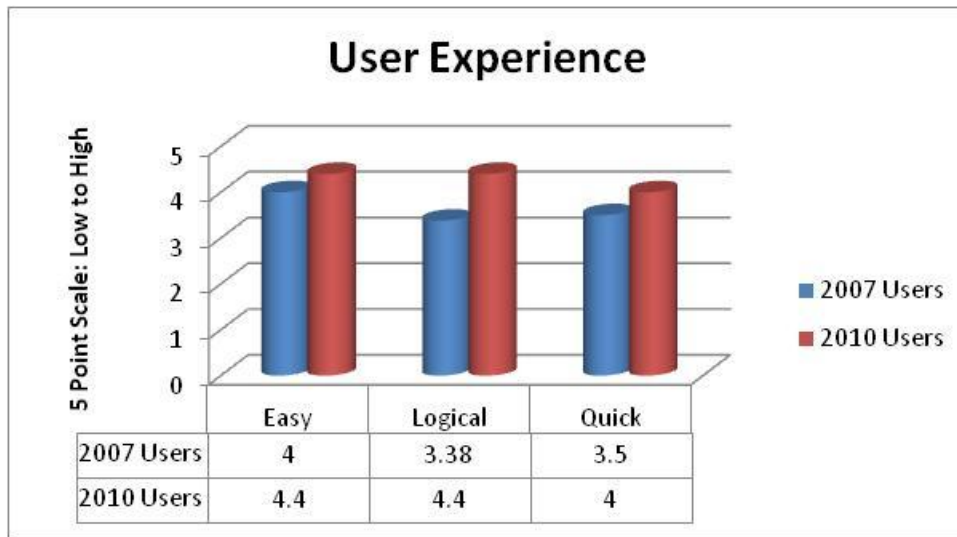
Appendix 1 - Research Method and User Experience

Research Method

Participants were recruited by phone from lists of Autodesk customers (AutoCAD or AutoCAD LT) in the San Francisco Bay area. They were asked whether they used AutoCAD LT 2007 or AutoCAD LT 2010 and assigned to either user group based on their answers. They were also asked proficiency with the software. Participants using each version represented a balanced mix of those “somewhat”, “very” or “extremely” proficient with the software. All testing was conducted in an observation room at Autodesk offices in San Francisco on July 29-31, 2009.

User Perceived Experience

Users filled out a short self-administered survey at the conclusion of the task exercises. Overall, users indicated that they generally felt that the tasks were not too challenging, regardless of the software version used. They also felt that they had completed the tasks with about as much or less effort and time as they would have expected.



Although the evaluations between LT 2010 and LT 2007 users do not vary much, AutoCAD LT 2010 users tended to have a somewhat better user experience than LT 2007 users. LT 2007 users tended to require more assistance completing the tasks than did the LT 2010 users and this assistance appeared to boost the ratings of those using LT 2007.