

DARATECH

2D vs. 3D Study – May 2008

Executive Summary

This study is about the relative merits of 2D vs. 3D plant creation and maintenance software and is based on the opinions of process and power industry engineers, managers and executives engaged in plant creation, operations and maintenance.

IMPORTANT NOTICE

This study was conducted by e-mail invitation using an on-line questionnaire. Consequently, study participants may not represent an entirely random sample of users. It is also possible that some study participants were seeking to skew the results to some questions. Nevertheless, the results of this Study confirm much of the anecdotal evidence that Daratech has gathered during the course of its 25 years of market research in this area.

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Plant design engineers made up 35% of the study participants while engineering managers represented 23% of the participants. The others were engineering IT managers and professionals, company executives and maintenance managers and engineers. More than half of the participants (51%) were from companies with more than 100 employees, while 29% came from companies with more than 1000 employees.

Participation was solicited by e-mail using a mailing list of 32,733 e-mail addresses provided by Access Intelligence, LLC, the sponsors of the daratechPLANT conference, as well as other lists. These lists were principally of daratechPLANT conference prospects, attendees, and process and power industry subscribers to Access Intelligence's publications targeted at the process and power industries.

The first 482 responses received were used in the study analyses. Responses were collected, on-line between February 7, 2008 and March 10, 2008 using the facilities of SurveyMonkey.com. **This Study was sponsored by Bentley Systems Incorporated.**

Highlights

- Almost two thirds (57%) of study participants whose company does not use 3D agree that their company will not be competitive three years from now unless it becomes 3D enabled: Only 13% strongly disagree.
- The benefits of 3D plant design systems fulfilled or exceeded the company expectations of 83% of study participants. Personal expectations were met or exceeded for a similar fraction of study participants.
- Project productivity increased by more than 30% for 45% of study participants while almost 20% reported increases of greater than 51%. Some, (15%) saw project productivity increases of greater than 76%.
- Individual productivity was improved at least 50% for more than half of the study participants, while a significant number (15%) reported more than a 76% increase.
- The top three benefits of 3D cited were: (1) changes implemented faster, (2) ability to bid larger jobs, (3) ability to be more competitive.

Other benefits cited were improved material control, better clash detection between disciplines, reduced field re-work. (Over half (55%) of the study participants use 3D plant

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design systems for clash detection. The others use “other” methods, mostly manual reviews with the aid of 2D systems or pen and paper methods. Plastic models are still used by 8% of the study respondents.)

3D System Benefit Proof Points

- The Study confirmed that companies sometimes choose not to bid on jobs because of their lack of 3D-system capability. About 39% reported that this has happened. Only 37% reported that this never happens.
- Of those companies that are 3D systems capable, 87% said they would use their 3D systems for small projects, even if it were not mandated.
- Fully 91% of study participants would use a 3D system for a large project even if it were not mandated.
- 2D system use was less than 15% for more than half (51%) of study participants, while almost a third (31%) used 2D for less than 10% of their work.
- Fully 73% of study participants agree that their job options would become more limited if they fail to learn how to use a 3D plant design system. Indeed, 72% said that they have already started or will start becoming proficient using 3D systems inside of three years.
- Only a very small minority (3%) of study participants have made up their minds not to become proficient using 3D plant design systems.

Top Rated 3D System Selection Factors

- Top rated 3D system requirements were (1) ease of use – 97%, (2) data management – 96%, (3) learning curve – 88%.
- Top rated factors in selecting a 3D Plant Design System were: (1) features and functions, (2) ease of use, (3) interoperation with internal systems. *It is interesting to note that cost, the top objection to implementing 3D systems ranks sixth as a selection factor.*
- AutoPLANT was rated higher overall than any other 3D plant design system, receiving more positive and fewer negative ratings by its users than its rivals received from their users.
- AutoPLANT was the easiest and least expensive 3D system to learn. The average time to become a proficient user of AutoPLANT was 140 days – less than any other 3D plant design system.

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- Users of AutoPLANT and MicroStation were the most satisfied with their system's ability to handle small projects. Small projects were judged as ones that had a total project cost of from \$10 – to \$300 million or involved between 200 and 1000 pipe runs.

Top Rated Objections to 3D Systems

- The most often cited reasons for not using 3D plant design systems were: (1) cost, (2) no experience, and (3) no time to learn. *We believe that cost factors cited by study participants are due to do with the loss of productivity they expect to experience while transitioning to 3D, and the higher cost of 3D-proficient personnel. However, these costs appear to be minor considering the benefits of 3D systems that this study has revealed.*
- Cost, no experience and concern about legacy design data were more important to large companies than to small or medium-sized companies.
- No time to learn was an important issue for small and large companies, but less of an issue for medium-sized companies.
- Concern over short-term productivity loss was most often a concern of medium-sized companies.
- More comfortable using 2D was a reason most often given by small companies.
- Project too small, was most frequently a large company concern.
- Additional reasons in responders' comments included lack of availability of operators, and hard to use and learn.

Acquisition Cycles

- Deciding which 3D system to purchase took six months or less for 43% of study participants, while a further 23% took between six months and one year. Only 15% took three years or more.

Transitioning Engineers from 2D to 3D

- Study participants believe that transitioning engineers from 2D to 3D systems will be within reach of all but a few: 74% believe that more than half of their engineers would be able to do so, while 27% believe that all will be able to make the transition to 3D.