How to Choose the Ideal CAD Package

An Online Continuing Education Course for Engineers

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How to choose the ideal CAD package

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1 Preliminary Considerations

Many Engineering Departments are using Computer Aided Drafting/Design software (CAD) to facilitate their internal communication as well as to facilitate the collaboration with their business partners (other departments inside the Company as well as outside organizations – suppliers, clients, etc.). Choosing the most suitable CAD application to satisfy the needs of the Engineering Department (and those of the Company) can be a daunting task given the vast number of options available in the market.

Employing the right CAD application is a brick in the foundation of the successful Engineering Department. Whether the Company is ready to upgrade an old, outdated CAD package to one that better fits its current needs, or if the Company is starting a new Engineering Department from scratch, it is imperative to make the proper decision at the very beginning. The wrong decision may end up costing the Company more time and money, not only due to lost productivity while using a less than adequate CAD package, but also due to re-training the CAD users, updating all the legacy data created with the old CAD package to a new CAD package, etc.

When trying to decide on which CAD program is more appropriate, the Engineering Manager is faced with many opposing requirements, such as the types of features vs. cost, the number of seats vs. cost, etc. In most cases, the more features are required, the higher the cost of the CAD program. At the same time, there are a number of CAD packages available on the market that are offering reasonable capabilities for a low price or even at no cost.

One of the oversights many people make when selecting a CAD application is considering only a few of the initial costs involved - they may forget about other very important factors like the Live Help support that is typically needed, the reliability and dependability of the software patches that need to fix problems found in early releases, etc. Software programs are notorious for having early versions with a large number of bugs and CAD packages are no exception to this rule – indeed, early releases can come with many problems that can negatively affect the productivity of the CAD users and result of the engineering and drafting re-work.

Moreover, the more money is spent, the more features are available to the design team. But are those features always needed? Can the Engineering Department afford to do without them, and outsource the work only when needed? Would this be a wise economic alternative? Everyone would like to have as many features available as possible “just in case”, but what is the point for paying for this, if these features are not used often enough to generate an increased revenue?

The following material will present factors that need to be taken into consideration before deciding on a CAD package for the Engineering Department and will provide a few recommendations on how to manage the selected program.

2 Definitions

The “Engineering Manager” is the assigned leader of the Engineering Department. The formal title can sound different (Lead Engineer, Principal Engineer, etc.), but the responsibilities of this position is to manage the engineering team, including handling its resource needs (personnel and assets). In this context, the Engineering Manger may be the one who decides the CAD package strategy.

The “CAD Manager” is the person that is in charge of maintaining the functionality of the CAD package. This person is usually is in close contact with either the CAD re-seller or the CAD manufacturer. He/she can be formally or in-formally designated by the Engineering Manager, depending on the size of the Engineering Department or the CAD maintenance workload. It is very helpful if this person is very familiar with the work of the Engineering Department so that he/she can understand what the CAD package needs to accomplish.

The “CAD user” is the user of the CAD software. Usually engineers and draftsmen have writing rights, while other CAD users may only have reading rights.

The “CAD seat” is the one CAD license that can be used by only one person at one time to perform drafting and/or engineering work. Typically the CAD packages are sold at price per seat.

3 The process of choosing a CAD package

Figure 1 shows a typical process flow for choosing a CAD package for the Engineering Department. It can be noted that the drivers for this process are the technical needs of the Engineering Department. There is no point in investing into a product that does not fulfill the technical requirements. They need to be clarified at the very beginning, and for this a certain amount of foresight is needed from the Engineering Manager.

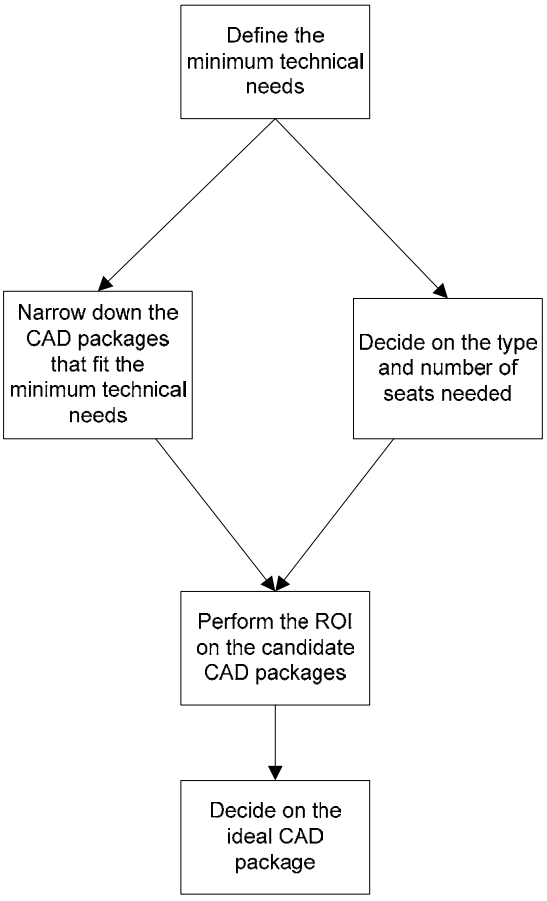

Figure 1: Typical workflow for choosing the ideal CAD package

After narrowing down to a number of CAD providers that can fulfill the Company's technical needs, the next step is to evaluate the remaining candidates based on the costs involved. A formal Return on Investment (ROI) analysis can be performed and the results can be used to support the purchase decision made by the Management

Team. The ROI will evaluate the engineers' and designers' productivity with the various candidate CAD solutions and based on that the best CAD package can be selected.

4 Technical needs

In the first stage of this process, technical criteria will be defined to select a few CAD package from the multitude of CAD solutions available on the market. Answering a few questions will help determine those needs.

4.1 How well does the package relate to the current CAD?

When the CAD package is meant to replace an existing, outdated CAD program, it is very likely that a large amount of legacy work (drawings, CAD models, etc.) needs to be updated. A few situations may be encountered:

- the proposed CAD packages may be able to read the old CAD format directly
- the two CAD packages may be able to read a common, CAD-specific format
- the two CAD packages may work on incompatible CAD formats and a common, neutral CAD format may be available
- the two CAD packages may work on incompatible CAD formats and a common, neutral CAD format may only be available thru a third party CAD translator will need to be found.

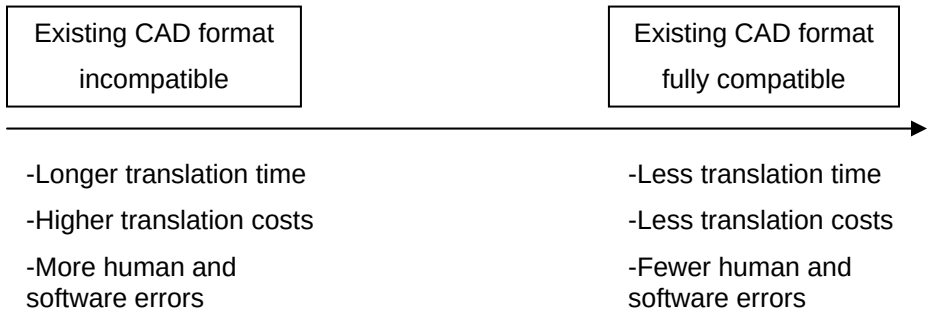

Figure 2: Advantages and dis-advantages related to the compatibility between the new and the existing CAD formats

It is obvious that the best situation will be when the two different CAD packages are using fully compatible CAD formats. In this case the conversion of the legacy data may be very simple, or may not even be needed, and is less prone to human and software errors.

When both CAD packages can understand a neutral format or a CAD-specific format additional time will need to be spent translating the legacy CAD data into the new CAD package. The larger the amount of legacy CAD data, the more tedious, costly and prone to errors the data translation process will be.

The least desirable situation is when the two CAD packages do not have the ability to use a common, neutral CAD format. This situation will require not only a third party CAD translation software, but also will require a very large amount of work to update the legacy data. The data translation process is more susceptible to both human and software errors. The errors generated by this process are usually missing features, in which case the CAD users will need to recognize when features are missing after which they will need to re-create them in th

4.2 2D or 3D

Usually, 2 e 3D CAD packages, but at the same time n a 3D CAD package. So which one is be nswer depends on the type of products deve

A 2D pack esigns are simple, if the products develop ts of paper, and/or if they can be described On the other hand, if the designed produc er, if they need to be represented in mo complex (geometrically complex parts and of components), then a 3D CAD package is more a Such a CAD package will allow for more viewing dexterity and provide a quicker, more flexible insight in the design.

A few examples of applications appropriate for 2D CAD packages are: