

Express Product Development (XPD)

We come across millions of products in our day to day life. Existing products become obsolete faster and new products proliferate at the same speed. There is also an increased awareness and expectations in the users. What was luxury features in earlier days have become necessary features in today's products. Aggressive competition to capture market share results in price pressures and quest for innovation. All the above has resulted in increase of product development activities at unprecedented levels.

Time to market has been the major focus in today's product development. Faster to market not only means huge cost benefits, but it also means early to market with new product introduction. This enables the releaser of the market to be in a dominant position to capture the market share. With the advent of new technology and user awareness there is always a growing consumer demand for new products. Along with this the competition is also increasing. To cope up with this situation, industry is in the constant look out of better development processes that can further reduce the time to market.

Product developers should also work as a multifunctional team. Earlier product development was more a sequential process. In addition to that there was what is called departmental walls or barriers. While the product data was processed in one department, the other department was mostly unaware of the development details. This process was not only lengthy but also gave room to errors. Especially at the time of encountering with design changes, the product had to travel back and forth causing additional delays each time a change is initiated. Concurrent engineering method of working reduced these issues to greater extent. Here product developers worked concurrently and shared the same information. Concurrent working enables better communication and led to fewer errors.

The most important stage in the product development is the CAD stage. It is at this stage the product gets shaped. However in most of the cases the inputs are incomplete and do not arrive in time. This either delays the CAD work, or at worse CAD is driven to a situation to proceed based on assumed inputs, the correction of which at the later stages would prove to be costly and more time consuming.

CAD is also important in another way because most of the product innovation gets frozen at this stage. In order to design innovative products, designers have to have insights in three areas namely

customer or users needs, technology insights and competitor products insights.

Normally designers have better knowledge of their own product; but have only partial knowledge of the contemporary products in market. As a result of the above many times they end up designing whatever is already in the market or a product that offers lesser benefits than the one that is already available

There is a need to enhance the product knowledge of the designer thereby making sure that the current design is on par or superior than the existing products in market.

The importance of CAE is in validating the design prior to manufacturing there by reducing the cost and time involved in physical trials. More the involvement of CAE in the product development process better would be the final product. If CAE had enough time to work, the designs can be well optimized resulting in substantial cost savings.

However in reality CAE in spite of the presence of high technology, often does not have enough time to process during development. Often CAE work involves in analyzing failures and rectification after the product launch. Hence in order to face the challenges in product development today, CAE has to involve as early as possible in the product development.

The final stage of the product development is perceived as manufacturing. Lot of efforts has been deployed in quickening the manufacturing process. However in reality after carrying out the manufacturing process, so rapidly, the product needs to wait for getting inspected and approved. During the first article production, in the absence of any gauges and inspection and acceptance criteria, the situation becomes unclear. Thus this area accounts for considerably delaying the product launch date. In order to avoid this last leg delay, the inspection processes needs to be streamlined and quickened thereby the products are rapidly inspected and further action initiated.

Express Product Development (XPD)- the new initiative is an attempt to mitigate the delays in the current product development process and to enhance the success possibilities thereby ensuring better cost savings.

XPD is the process of expediting the product development process by enabling enhanced product visibility. Deploying appropriate data

capture and an analysis solution throughout the product development process forms the core of the XPD process.

In the conceptual design stage, XPD process advocates maximum use of available product data and competitor data in physical form. The physical form of the data is converted into digital form enabling analysis, bench marking, and adoption etc during the conceptual design stage.

Capturing the assembly and mating part information in order to complete the detailed CAD design also forms an important use of the XPD process. Getting this information to the designers screen can provide enormous benefits of doing the design quicker and right at the first time.

Conventional CAD model is done feature based and takes time to complete. However XPD advocates wherever possible to do a quick surfacing based on the point cloud input. Quick Surfacing capabilities are available in the latest CAD tools and serve as a boon in cycle time compression. In order to do a quick surfacing, the scanned data should be denser. The quick surface model would enable lot of post CAD activities enabling cycle time compression.

Generally CAE process waits for the completion of parametric model from CAD. XPD advocates early start of the CAE process by starting meshing directly with the scanned data or quick surface. This enables CAE results to be fed in the first release CAD model. This means lesser CAD design iterations thus saving cycle time. Quick CAE thus done throws more insight of the product being designed. It also provides sufficient time to CAE to analyze more parts of the product and also optimize their design.

Finally in the CAM stage, XPD advocates automating the inspection process in order to take fast and accurate decisions on the inspection process. Computer Aided Inspection (CAI) usage in product development, helps cycle time reduction and avoids errors creeping in production which may cause bigger problems later.

Thus, XPD benefits touch all the areas of product development namely CAD, CAE and CAM. When followed systematically XPD can offer substantial cost and time benefits and offer innovative products to the market.