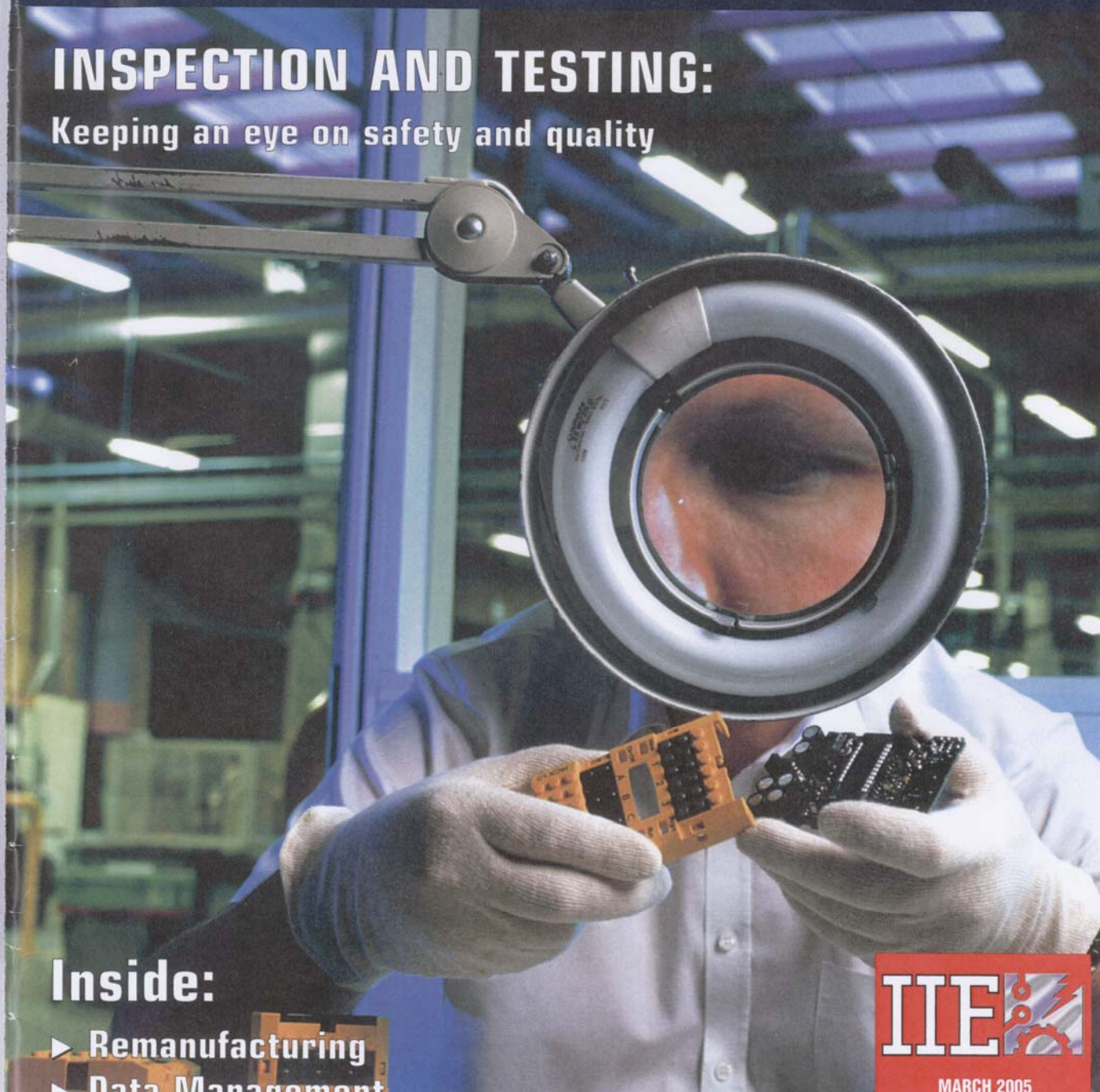


ENGINEERING TECHNOLOGY

INSPECTION AND TESTING:

Keeping an eye on safety and quality



Inside:

- Remanufacturing
- Data Management



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COMMENT

DESIGNING THE QUALITY IN

Suchit Jain

It doesn't take skill to cut product design costs: just cut time and material, and costs go down. The skill is in cutting time and material while producing better products – the eternal conflict that pits companies' engineering managers against financial managers. Desktop analysis software gives engineering managers and executives an ally in their challenge to help bottom lines without sacrificing quality and sound engineering practices. Analysis applications enable designers anywhere in the product development process to test how designs will behave as physical objects before prototyping or full production. Catching and correcting errors when a design is still on the computer screen takes just minutes, while fixing a prototype or a finished product can halt production for days or weeks.

Analysis is not just for experts now. It turns every designer into a quality control cop, replacing dependence on specialists and on over-designing, a persistent cause of unnecessary expense. Companies using analysis software throughout the design process typically have fewer costly late-stage design errors, need fewer physical prototypes, and meet almost no post-production problems. Faster time to market gives an advantage over competition.

Today's analysis applications are mature, reliable products that are already driving efficiencies and cost savings in industries from consumer goods to aerospace. There are no sound technological or financial reasons for resisting broader use of analysis software. The barriers are cultural. The current engineering managers and executives know about analysis, at least in concept. It has been around since the 1960s, when aerospace engineers adopted it. However, those complicated, expensive applications bear no resemblance to the affordable, easy-to-use software available today. Engineering managers owe themselves and their companies a new look at this technology.

Early FEA ran only on mainframes or specialised workstations and yielded numeric results that analysts would interpret for designers. By the 1990s, analysis came out of the back room to run on desktops with 3D images rather than numeric data. But it was, however, still mainly the domain of specialists.

Some companies that couldn't afford the software and specialised staff relied on hand-calculated analysis, outsourcing, and physical prototyping to test designs. Most, however, just over-designed products to ensure they met physical requirements. Though over-designing usually yields sturdy products, higher material costs erode profit margins. Unable to absorb lower margins, small companies began using FEA to analyse designs throughout the process. Today, companies use analysis to cut time and materials while developing superior products. And quality gains go hand-in-hand with time savings.

Regardless of how advanced analysis software has become, past a certain point software can't replace human analysts. Nor should it. Some tasks are simply too specialised for anyone but a highly trained analyst. But analysts should not be doing all the analysis all the time, bogged down with small, non-critical work. Why have an analyst test a small part in a complicated assembly when a designer can do it, leaving the analyst to concentrate on the assembly's overall performance? Software can eliminate the congestion that slows the design process and inflates costs. Integrating analysis into design processes is a matter not just of technology, but of good management.

Suchit Jain is Vice President, Analysis Products, SolidWorks Corporation.