

7-10-1961

## Art and Industry (1962): Article 06

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### Recommended Citation

Bowles, James D., "Art and Industry (1962): Article 06" (1961). *Art and Industry (1962)*. Paper 21.  
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## THE QUESTION: *Must the product*



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 Manager, Tape Unit Div  
 Ampex, Computer Products Co.

James D. Bowles joined Ampex Corp in 1954 bringing to Ampex a broad background in both engineering and management. After working with the United States Rubber and Illinois Steel Corporations, he served as Chief Engineer for the Mission Appliance Corp from 1950 to 1954. His university education has included study at Kansas State College in Electrical Engineering and additional work in Business Administration and Education at Indiana Univ. During his seven year association with Ampex, Bowles has held a number of administrative positions, and at present is Manager of Ampex Computer Products Company's Tape Unit Div. The division specializes in the manufacture of tape memory systems used in the computer industry.

—W B W

Redesign or begin anew? This question has been argued by every chief engineer, sales manager and company president. Here is an engineer's approach.

■ All too often, modern designs are conceived in the spirit of uniqueness rather than meeting the need for functional excellence. By this I mean that far too many designers prostitute professional morality for sales expediency.

"Give us a gimmick edge over the competition," is the plea of the sales department. "Give us a sales lever," they say. "It doesn't have to be better . . . just make it different!"

Company management is also guilty of nurturing the downgrading of design honesty. Far too many companies equate change to progress. They consider any change to be an advancement and pressure their engineering departments into unsound or premature changes in the illusory hope of creating a corporate image of progressive leadership. The result . . . an unforgivable waste of engineering talent that could be better spent debugging and upgrading existing designs to optimum performance. And there is a direct monetary loss also. Disillusioned customers turn from spurious "advancements" to more reliable products.

The era of glamor in design is upon us and can largely be attributed to the Missile and Space Age. Bizarre new materials, exotic fuels, electronic brains . . . all have helped to foster the fantasy that only the new and different are worthy of consideration. The complex and rapidly changing character of missile design has added another dimension to the over-all design consideration that exaggerates the urgency for newness. How many times has the decision been made to eliminate the cost of design maintenance on the assumption that next year will see the design obsolete? The minor design errors or inconveniences are tolerated in the expectation that the basic design will be replaced by a new concept in the near future. The pressure of expediency forces maximum effort to be expended in the creation

## *be redesigned every year?*

of new concepts—to the near exclusion of intelligent redesign that would upgrade existing concepts.

Manufacturers are certainly not alone in their guilt. The product customers demand the very latest in the state of the art. A new tape recorder must have the highest obtainable band pass. It must have the highest signal-to-noise ratio and the lowest flutter. If it turns out that the operator has to reach over the console and give the reel a little spin to "sync-in," or if after a limited number of hours some adjustments have to be made, or if before each test is run the recorder has to be calibrated—all this can be lived with as long as the basic technology is the latest. I think that the bulk of the instrumentation designed in the past few years has been conceived on this basis. The designer could never completely design his product. Before he got the bugs worked out, the customer was pressing for deliveries—the designer was required to deliver in 9 months instead of 18. Everything was on a crash basis. It is truly remarkable that some of the designs work as well as they do.

I don't wish to imply that research for new concepts should be sacrificed in a zeal to improve existing designs. Research is essential for company growth, but what I do emphasize is that existing designs should be brought up to their highest reasonable capability before being junked in favor of new concepts at an inferior stage of development.

I personally believe any company that does not emphasize reliability and performance per dollar is perpetrating dishonesty upon its customers. Reliability can be emphasized and performance cost can be reduced only by spending more time on the evolution of proven designs.

Everyday we are confronted with examples of change for change's sake. The automotive industry is probably the most obvious offender. Each year, on a regular schedule, the Detroit designers spend a phenomenal amount of engineering talent to create changes instead of improvements. Frequently, the changes are not only non-improvements, but a backward step as well. One example that comes to mind is a fancy gimmick for selecting automatic-transmission drive positions. This "revolutionary" change not only fails to be an improvement over the conventional selector lever, but is awkward and less flexible to use.

Foreign cars have also taken up this wasteful trend. The

one salient exception is Volkswagen. VW has an announced and practiced policy of making no changes except to significantly improve the car. These changes are not made on a fixed schedule, are made only after they have been proven reliable according to the VW policy. While business has declined for all other foreign automobile manufacturers, VW has continued to increase its sales in this country.

This is a healthy trend that should be taken up by all industries—more effort to improve the existing and less emphasis on being different. Of course, even this well-founded policy can be carried to extremes. The American sewing machine industry is a perfect example. For decades, no changes were made in the basic design. Then, right after World War II, foreign sewing machines invaded the American market with completely new concepts and dealt a severe blow to our manufacturers. Americans were forced to create competing designs in a hurry. The expected results occurred—some inadequately tested designs failed in service and customer confidence was reduced.

Another design waste that runs parallel to unwarranted changes is the penchant some companies display for over-designing. The simple, straightforward approach seems to be abhorred as an indication of technical incompetence. Again, the automotive industry is a prime offender. Large expanses of windshield glass in convertibles are supported by beef-up frames and tricky innovations concealed in the body design. In contrast, one manufacturer, Mercedes-Benz, has the courage to approach the problem with a simple and logical solution. In its model 190SL, it places a slender steel rod in the center of the windshield, running from the top of the frame to the instrument panel. The windshield is adequately supported and driver vision is not appreciably impaired.

Awe and reverence for esoteric technology and the constant expectations for something new are slowly and surely being replaced by demands for more reliability and operational excellence. How the manufacturer can give his customers more honestly designed products would fill many volumes of text. But the basic precept can be summed up in one sentence: More true advancement and value will be found in upgrading an existing design than in a myriad of untried new concepts. ■