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Ohio Instrument Case

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The following article is a sample drawn from the AICPA Professional Development self-study program. This example, dealing with automating a parts inventory, is typical of problems posed to students—

THE OHIO INSTRUMENT CASE

by John Heptonstall
Education for Management

THE following material, which poses a problem situation on these pages and presents the solution on page 55, is typical of the case histories included in the Management Education Portfolio, a set of such studies offered by the Professional Development Division of the American Institute of CPAs. The M.E.P. is a self-study program available through the Division, and inquiries about other problem cases and their solutions should be addressed to Professional Development Division, AICPA, 666 Fifth Avenue, New York, New York 10019.

The way the self-study course works is this: Registrants receive a three-part study program in a looseleaf notebook. The first part, the Text Section, introduces and explains the management subject under study, and gives decision rules to help the student to devise the best plan of action for given management situations. The second part, a programed case, presents an actual business situation in a cohesive, step-by-step manner, and presents the actual described solution found for the problem presented. The third phase, the Examination Case, represents the final section of each course, and presents a somewhat similar case in a totally unstructured way. It is up to the participant to analyze the information presented, determine the relative relevance of each piece of information, and propose in writing his solution to the problem as he sees it.

This written solution is sent to the consulting firm that prepared the course, Education for Management, in Boston, Massachusetts. There experts will grade, evaluate, and send written criticisms of the student's solution. Assuming that the student's solution is satisfactory, he will be awarded a Certificate of Completion by the American Institute of CPAs.

Education for Management, the Massachusetts firm that prepares this material, also markets it to other professional organizations. Thus, the case history printed here has already appeared in the December issue of *The Professional Engineer.*

IN DECEMBER, 1969, Mr. Robert Taggart, Plant Engineering Manager in the Waterville plant of the Ohio Instrument Corporation, had a problem on his hands. This problem involved electronic computers and just what they could and could not do. Taggart, a mechanical engineer by training

and experience, had not previously had any personal contact with computers and was not certain what his next move should be.

Ohio Instrument, founded in the late nineteenth century to produce clocks and watches, have steadily evolved into a wide range of engineering activities. The first significant departure from its traditional business had come in 1912, when a line of speedometers, clocks, mileage recorders, and fuel gauges had been introduced for sale to the rapidly growing automobile industry. Automobile instruments and accessories remained an important factor in company sales in 1969. By this time, however, the company's activities included the development and production of aircraft instrumentation, flight simulators, and landing aids; industrial recording and data collection equipment; burners and fuel feed systems for industrial furnaces; and a recently introduced furnace for use in domestic central heating installations. The company expected to introduce a number of other consumer-oriented products in the near future.

The Waterville plant was shared by the Automotive and Industrial Products Divisions and produced automobile heaters and air conditioners and a wide range of digital recording devices used in high-speed production machinery. Taggart had been appointed to his present post in March, 1969, and had previously been General Foreman of Maintenance Engineering in a large engineering plant in the Detroit area. His responsibilities at Waterville included all maintenance of production machinery; the provision and maintenance of heat, light, and power to all buildings on the site; the plant engineering stores; and an engineering facility known as the "model shop," providing services to both the automotive and industrial activities, in which drawings of new devices were turned into hand-made prototypes, mock-ups, and test rigs.

Taggart had been seriously dissatisfied with many things in his area of responsibilities when he took up his appointment. The most serious and urgent problem had been the complete absence of any preventive maintenance plan for production machinery. Taggart devised such a system and brought it into use, despite some initial skepticism on the part of the maintenance foremen. By late 1969 the preventive maintenance program was fully operational. Taggart then turned his attention to the plant engineering stores.

Three types stocked

The plant engineering stores, or "No. 3 stores" as it was known at Waterville, stocked three distinct types of stores: maintenance parts for the production machinery such as bearings, spindles, cutting heads, and tool holders; consumable stores such as lubricants, cutting oils, and industrial cleaners; and standard production parts. This latter category included parts that were not ordered or produced for any one particular product or group of products but were used in a wide range of different items. These parts were primarily machine screws, self-tapping screws, nuts, washers and locking devices, and a range of basic electrical components. In all, No. 3 stores held more than 30,000 separate items in stock. The stores staff consisted of a foreman, a leading hand, and three storemen and four stock control clerks.

Inventory records for all parts were maintained on standard cards. All issues and receipts were entered onto the cards, and a running total of stock on hand and on order was recalculated after each transaction. In addition, the re-order level for each item was entered onto its record card. Every time an issue was entered onto a card, the stock clerk was instructed to compare the balance remaining on hand and on order with the re-order level. If current stock and orders were below the re-order level, the clerk would make out a parts requisition which was then sent to the plant purchasing section, which placed an order with the appropriate supplier.

Taggart had received a number of complaints about the service provided by No. 3 stores. Parts had frequently been out of stock when needed, and vital production machinery had sometimes been idle for two or three days until the necessary spares were obtained. Inquiries usually revealed that the inventory records for these parts indicated that stock *was* in fact on hand, but that the stock shown on the cards did not exist in practice. Taggart believed that such a situation might arise from a number of reasons: failure on the part of storemen to record all issues, mistakes made by stores clerks in calculating current balances, time delays in the transferring of issue data from storemen to record clerks, unauthorized and unrecorded withdrawals from stock by production personnel, and pilferage. Taggart wished to improve the service that the stores provided to the production activities. He was also, in late 1969, under pressure from the plant's general manager to reduce payroll costs in his area, and believed that the most promising area in which to achieve such an economy might be the stock record section in No. 3 store.

Computer potential investigated

Although he had no direct personal experience of EDP applications, Taggart was well aware that many companies had applied computers to inventory control problems. The Ohio Instrument company already used computers for a number of routine data processing applications, and one system, an IBM 360/40, had been in operation at Waterville since the fall of 1968. Taggart decided to talk to the supervisor of the Waterville computer installation to see if stock control in No. 3 store might be a potential computer application. The EDP supervisor, George Crane, said that he could see no good reason why the stores control could not be computerized, and that con-

siderable free time was currently available on the Waterville computer. He suggested that Taggart should get in touch with Jim Kennedy, Systems Planning Manager at Ohio Instrument's corporate headquarters.

Kennedy and one of his senior analysts visited Waterville one week later for initial talks with Taggart, and the analyst, Mike Mancini, remained at the plant for five days gathering additional data about the proposed application. Two weeks later, a meeting was arranged at which his findings were to be presented. Those present at the meeting were Mancini, Kennedy, Crane, Taggart, the foreman from No. 3 store, Henry Douglas, and the store's leading hand, Frank Smulkowski. Mancini said that the proposed application was certainly technically feasible. He could not yet say with any certainty whether the conversion to EDP was economically justifiable; that question would have to wait until an application feasibility survey had been performed. On the basis of the frequency of issues he had observed in the stores, however, he considered that a full-scale survey would certainly be worthwhile. He envisioned a system in which records of all the stores parts would be maintained on a file in the computer facility. All transaction data would be communicated directly from the storemen to the facility by means of a teletype link. Each transaction would be automatically punched into a card, and the stock file would be updated by means of these cards in a daily updating run. The program would include a routine that compared stock and orders with the new balance after each transaction and printed out a list of parts that had fallen below their re-order points. He estimated that a net saving of three people would be achieved, together with a substantial gain in accuracy, and he proposed that a feasibility survey should be started as soon as possible. Kennedy endorsed this proposal. Taggart then invited his own subordinates, Douglas and Smulkowski, to comment on the proposal.

Rebuttal

The response was electrifying. Douglas, who had been sitting silently during Mancini's presentation and making notes on a pad, said:

"I hope you'll not object to me speaking straight. As I understand it, we are here to decide whether the computer can take over our stock record and re-ordering jobs. Well, there is no doubt at all in my mind that it can't. You gentlemen may know a lot about computers, but you don't know much about running plant engineering stores. You obviously think that everything my people do is completely mechanical. Well, if it was, then I expect your computer could do it. But what they do is far from mechanical. They use their heads all the time. Say somebody from a production department comes in with a requisition for two gallons of 100147. If I understand it correctly, the computer would check the record for 100147, and if we didn't have two gallons, it would say "sorry, no stock." Now, one of my boys would know that 100147 was a cutting oil, and he would know that 100540 was a very close equivalent. He would see if we had stock of that, and if we had he'd call the production foreman and suggest using that until the 100147 came into stock. The computer won't know that sort of thing. It seems to me that you'll have a much less efficient system, not a more efficient one. What do you say, Frank?"

Smulkowski replied:

"Yes, I tried to explain that to Mr. Mancini when he was with us, but I don't think he took much notice. And I think the computer will make an even bigger mess of things when it comes to placing orders. What happens now is this: One of the clerks enters an issue on the stock card and finds that the stock is below re-order level. What does he do? Well, he doesn't just order that part. Say the part is degreasing fluid, and he knows that we buy that from Brown's in Cleveland. He will look at all the other lines we buy from them, and if any of them are anywhere close to re-order levels he will order them as well. That way we only have to make out one order for maybe 10 or 20 items, and Brown's can probably make up a van load to send to us. The computer will be telling the purchasing people to buy one item from a supplier, and we'll have everything coming by parcel post. It'll paralyze us."

Mancini and Kennedy tried to persuade Douglas and Smulkowski that their fears were groundless but were unable to do so, and the meeting broke up on a note of discord. Taggart wondered what to do next. He had expected his subordinates to be somewhat hostile to the computer system because it threatened their own responsibilities. Nevertheless, they had made some good practical points. It would be disastrous to incur the trouble and expense of converting to a computerized system only to find that it was less efficient than the old manual one. Perhaps these computers were not quite as clever as people said.

What would you do in Taggart's position? Is there any way of overcoming the problems Douglas and Smulkowski have raised, or is the stores operation too complex to be effectively automated? Turn to page 55 for a solution prepared by a computer specialist.

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