A Practical Solution for Doing More With Less

Artificial Intelligence

Artificial intelligence (AI) is the science of making machines "intelligent" or, to act, as we would expect people to act. Today in American business, this science assumes increasing responsibility as work forces change and managers are forced to do more with less. AI is a set of very powerful business tools that can be used to solve business problems. Expert Systems (ES) are the computer program (or programs) that use AI to behave like a human expert in some useful way. Early Expert Systems assumed rule-based reasoning. For the credit function, this had a natural application such as giving points in response to questions on a credit application and totaling those scores help credit executives decide whether or not to grant credit or to "kick out" the applicant for exception handling by a trained credit analyst. To develop a system, a credit manager selects a random sample of customers and analyzes them statistically to identify which characteristics of those customers could be used to demonstrate creditworthiness. Then, again using statistical methods, a creditor will weigh each of these factors based on how well each predicts who would be a good credit risk. Expert systems and artificial intelligence are among the information system technologies changing the credit function as pointed out in the Credit Research Foundation's recent study on The Future of Business Credit.

Expert Systems address problems normally thought to require human specialists for their solution. Performance requirements for an expert system are the ability to perform at the level of an expert, using the advice of human experts, while matching the results of a competent human expert. They should be designed to raise the level of human expertise, by augmenting the individual's reasoning process or capability in a particular domain. Expert Systems must be able to explain their reasoning or justify their decisions on demand in a manner that is intelligible by the user. In short, an Expert System can be thought of as a model of the expertise of best practitioners (as defined by the user) in the field.

A Practical Use for the Credit Function

Senior credit executives establish guidelines or rules in their company's credit policy and procedure manuals for credit analysts to follow when evaluating applications and reviewing existing customer credit files. But, equally important to those predetermined guidelines, is the

experience and biased judgment of the skilled credit analysts when assessing credit risk. Relying on subjective analysis as credit operations have done since the beginning of the concept of "lending on faith" however has some important limitations. Credit analysts typically differ in their experience and in their views regarding the relationships between risk and specific credit characteristics of applicants. Consequently, companies cannot be sure that its analyst's are approving all customers consistent with the objectives of the company policy. In addition, because of the numerous and often complex factors credit analysts need to consider, subjective analysis is time-consuming and costly. Therefore, scoring became popularized and has been used in many credit operations for decades. The competitive pressures in the consumer credit arena in the 70's, particularly for auto loans and credit cards, forced this technological advancement in information processing and risk analysis to create a more quick and efficient credit operation. This methodology enabled a logical transition into the commercial credit arena.

To facilitate the process of analyzing a customer's credit-worthiness, reduce costs and promote consistency, credit scoring models have been developed that numerically weigh or score some or all of the factors considered in the analysis process and provide an indication of the relative risk posed by each new or existing customer. In principle, a well-constructed credit scoring system holds the promise of increasing the speed, accuracy and consistency of the credit evaluation process while reducing costs. Most credit scoring systems are unique because they are based on a creditor's individual experiences with customers. Once the creditworthy criteria have been identified and statistically characterized from a random sample of customers, a system can be developed. Thus, credit scoring can reduce risk by helping creditors weed out potential problems which posses excessive risk and can also increase the volume of reviews performed in a given period that leaves more time for value added work to be performed by today's leaner credit operations. Credit scoring is a process that uses subjective and objective information about prospects and customers. The information comes from many sources such as the in-house chronicled customer files, from industry credit group sources or purchased from a credit information supplier such as Dun & Bradstreet, NACM, or Experian.

Business credit operations utilizing scoring proficiency generally use it in conjunction with a broad-based credit-by-exception system to add greater value to their cybernetic operations.

The combined use of these two separate, but related automated utilities, relieves some traditional, routine tasks previously requiring credit staff and permits a leaner staff of more technically trained analysts to spend their time dealing with the exceptions, working out mutually acceptable credit arrangements with marginal customers. Therefore, it is reasonable to expect systems to handle the evaluation of the customer's current condition in relation to the probability of future successful sales. Typically this combined process will examine total owed (including a valuation weighing past due dollars), open orders, new orders, orders on pick tickets, packed and held orders, and shipped and not billed orders, against the existing credit guide line (limit); determine if the guide line is fresh or within a reasonable (per policy) time period; evaluate the need to update the credit file; and perform a scoring routine which weighs proprietary information with that gathered from external sources (credit agencies, interchange groups and references, and financial statements) to determine a likelihood of successful payment performance.

Developing a Credit History Scoring System

Credit scoring can be a simple stand-alone system, implemented via a "homemade" spreadsheet that has a user-determined set of factors that are germane to the users industry and organization. Most credit scoring systems share some common elements and consist of at least the following: records of bankruptcy, current and historic delinquency (at a determined detrimental period such as 91 days), number of years the business has been in operation and years of experience including a record of the current management and ownership, etc. Weights are assigned to each value, then the weights are tallied and a score is yielded. The score determines the next course of action. As a screening technique for streamlined evaluation, the senior credit executive will establish a threshold score corresponding to low credit risk. Potential or existing customers with scores within the low-risk range generally would be eligible for a quick review that focuses primarily on verification of information and perhaps routine feedback with the sales partner to discuss the long-range plans of the subject under investigation. This method allows those making credit decisions to reduce costs by enabling companies to spend less time on the low-risk applicants/customers and more time on those situations that involve more complexity and pose a greater credit risk.

Taking credit scoring to the next step might include the use of AI by a company predicting customer viability or failure, based on its own historical credit files in conjunction with outside

data. The data from the scoring analysis is digested or learned by the computer program and predictive models can be established to forecast the future for a subject. The information is used to predict, in a *quantifiable and consistent manner*, the future performance of the subject regarding their projected payments and viability. The programs operate in relatively specialized (expert) task domains rather than performing commonsense reasoning tasks, and like human experts, in addition to providing a solution, expert systems should have the ability to explain their solutions. These explanations may include the logic used to arrive at the solution (rule trace), similar previous cases, and other relevant information. Like human experts, expert systems can handle uncertain and incomplete information. Some definitions require that the system perform at the level of an expert, while others require only that the system offer intelligent advice. This type of predictive analysis has other uses such as portfolio management that monitors a segment or the whole customer base and can be used, for example, to determine the appropriate level of reserves to set aside for losses or to assist sales in defining marketing opportunities. Similarly companies whose financing is tied into their receivable balance can use this analysis to evaluate the quality and value of the A/R quickly and with confidence. Periodic validation of the scoring model will be necessary to ensure that the model retains its accuracy as business conditions change.

Concerns from the Practitioners Point-of-View

Credit scoring alone principally uses objective (unbiased) analysis. Sales departments may argue that "artificial intelligence" has been used in the credit department for centuries; but it is not until very recently that the broader based use of subjective (biased) analysis has entered the picture. Knowledge based enterprise systems found in many companies today, have exposed the organization (beyond the credit activities) to this valuable, advanced method of problem solving. Yet it could be argued that these enterprise systems (integrating all operational activities of the organization) are developmentally inadequate for all facets of business applications. Knowledge based systems used in an enterprise environment that simulate knowledge based manufacturing, perform an excellent job in many manufacturing assignments. The strengths of this technology lie in some of manufacturing's most critical components: sourcing, materials utilization, fabrication, production, inventory control and distribution, but often are grossly inadequate in many of the important integrated financial systems--typically receivables management. Often, these knowledge-based systems gnaw at the existence of the credit trade by tending to make the function too routine. Therein lies a

business conflict, not only for the credit experts, but also for many business leaders. Knowledge based systems using artificial intelligence tend to look at the world through the proverbial "rose colored glasses" inducing senior business leaders to become excessively enthusiastic in staff reduction initiatives. When enterprise systems are implemented using knowledge based reasoning, too often the function of credit checking becomes a perfunctory task. Taken lightly in the broad scheme of the business and often aggravated by the piece of the order-to-cash process being administered by someone untrained to make prudent credit decisions, the credit function is left without an ally to save it from near extinction. The tendency for these systems to function under predictable (programmed) circumstances has demonstrated great success in a perfect-world scenario; however ironically, when significant unpredictable circumstances enter the picture (as they inevitably will) human experts are required to return to the scene as consultants to perform the routines that the machines have not yet been taught.