making, and activities necessary for IT to create value. Most valuation approaches call upon knowledgeable subject matter experts and stakeholders to identify value-adding activities and processes based on their personal domain knowledge, experience, and familiarity with the system. Unfortunately, depending upon the various interpretations and interests of analysts and stakeholders leads to biased and conflicting estimates of value.

Identifying the distinct contribution of complementary assets to IT value production raises another problem. Complementary assets increase in value because of IT, including labor (decision making and information use), equipment (production control, such as CAD/CAM or CNC), and products (value-added services and product enhancements), but these assets also have value independent from the IT contribution. When assessing the value contribution of IT, these two types of value must be separated. The intrinsic value of complementary assets needs to be separated from the value contributed by the IT asset; otherwise the calculated value of IT is overinflated. In identifying IT-specific contributed value, firms must separate the IT contribution to discrete work practices, isolate IT-based impacts on operational and strategic processes, and unbundle the contribution of IT to management decisions.

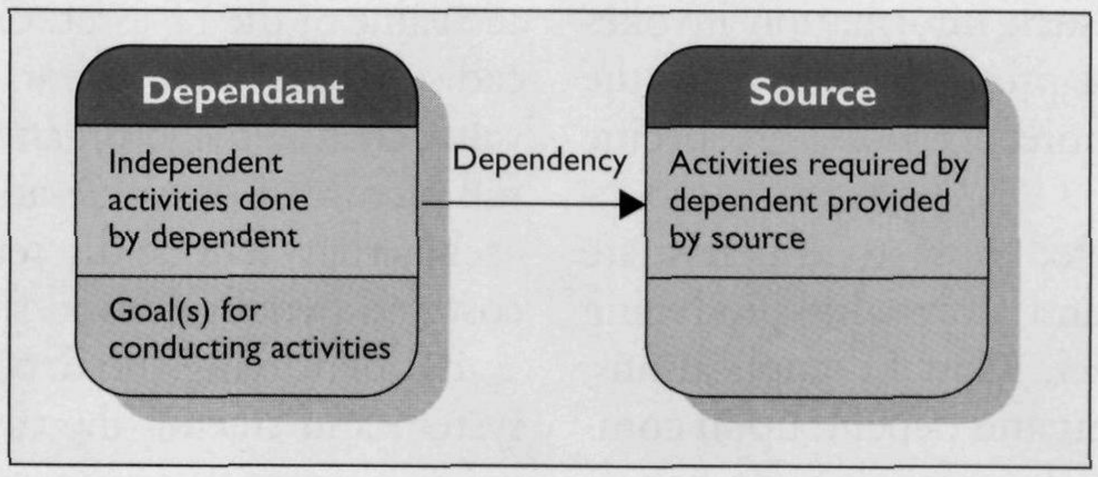

Figure 1. Representation of a dependency.

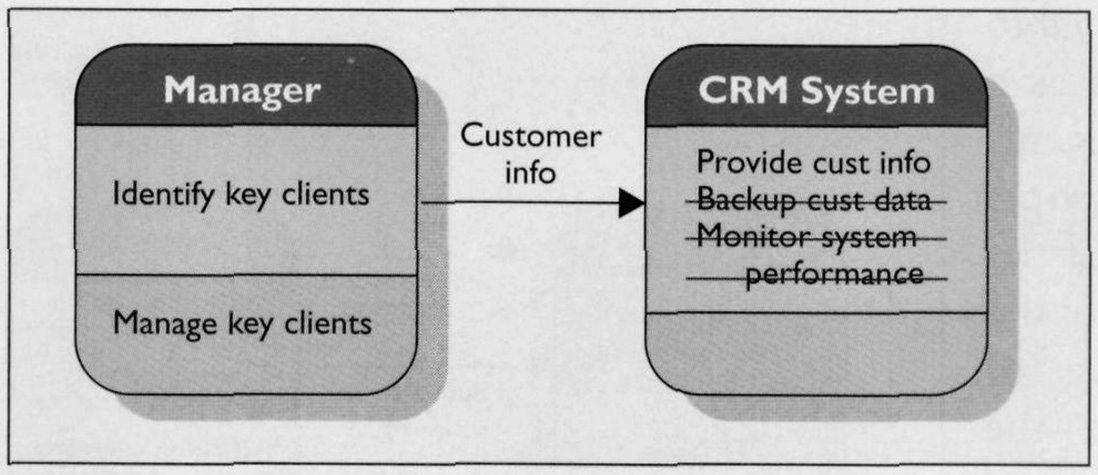

Figure 2. Isolating complementary value producing activities within asset scope.

A Dependency Approach to Business Valuation

To understand how to identify and isolate value, we must first examine how value is created within the firm. Firms use assets to create value for the organization through the creation or exploitation of valuable resources. Resources themselves have no intrinsic value, but become valuable when needed to accomplish some goal. Value itself, then, materializes through the relationship between someone with a need and someone with resources to satisfy that need. The relationship between the two is a dependency of one upon the other, expressed through an exchange relation, and economic value is the outcome of the dependency [1]. Using this notion of value as resources-at-work, we can focus on the value-creating exchanges an asset passes through to paint a complete picture of the asset's true value.

To identify and trace the various value-producing exchanges, we will employ the Dependency Network Diagram (DND) methodology [9] to focus on the exchange of resources. DNDs are representations of roles, goals, activities, and governance controls involved in exchange relations. Unlike other methods that focus on the flow of information, materials, or the relationships between data, DNDs represent organizational relationships that are quite revealing about the relative importance of activities, entities, and their relationships. Assets used in exchanges are depicted graphically as rounded rectangles separated into three areas: their names, their activities, and their goals. Dependencies are represented by an arrow from the resource-deficient asset to the supplying asset (Figure 1).

While IT systems perform a variety of activities, not all generate value. When a need to use an IT system occurs, a cascading sequence of activities is precipitated that ultimately results in the resolution of the initial need. For example, a customer relationship management (CRM) system (an IT asset) is involved when a customer contacts an organization. The CRM system provides customer information to the account manager in response to the customer's contact (see Figure 2). Providing customer information is an activity invoked as a result of the customer contact, and this defines the CRM system's asset-specific value. Activities the system can perform that were not activated (such as data backup or utility programs) are left out of the value calculation. The activities not crossed out in Figure 2 define the CRM system's value asset specificity. In this way we can differentiate between value-producing and non-value-producing activities commingled within specific IT assets.

Of course value-generating assets may be invoked by more than one event. Aside from facilitating the customer interface, the CRM system may generate value by, for example, providing summaries and analyses of customer demand for marketing purposes.