

How Technology-Purchasing Decisions Are *Really* Made

*Understanding How Influence Networks Affect the Success
of Major Technology-Purchasing Decisions*

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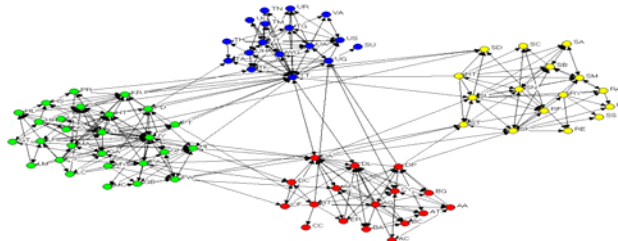
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Executive Summary



Introduction

For both large corporations and the vendors that serve them, there are few more important issues than making major technology-purchasing decisions successfully. Although technology expenditures form a greater component of cost structures than ever before, the success of these purchases has not improved at the same rate, at least not when measured as return on investment (ROI). In fact, there has been much debate about the ROI of technology purchases in recent years, with some arguing that the more firms spend on IT the less ROI is realized.^{1, 2} Understanding successful purchase decisions helps both the enterprises that adopt these technologies and the vendors that sell these products.

What, then, drives effective technology purchase decisions? Clearly, the expertise of individuals involved and the processes used to evaluate and approve technology purchases play a substantial role. What is often underappreciated is how relationships and networks in organizations influence these critical decisions. These relationships form a rich collection of internal and external roles, including IT and business professionals, peers, consultants and vendors. Although well-placed connections are always helpful in these situations, quantifying the full effect of these seemingly invisible interactions is a challenge.

Organizational network analysis (ONA) provides one means of visualizing these relationships and understanding how they affect successful technology purchase decisions. This study applies state-of-the-art methodologies to reveal how networks influence purchasing decisions and what can be done to promote more successful decisions. It is based on a detailed survey of decision makers in 289 organizations that made major technology-purchasing decisions during the previous year.

Understanding influence networks

Most information that decision makers collect and act on comes from their network. People – not databases or paper reports – form the primary source of information they use to formulate and validate decisions.³ One study by Tom Allen of M.I.T. showed that employees seeking information were about five times more likely to go to a person than to search databases or documents. The patterns of how people communicate and information flows within an organization show the “invisible” organization. Although this cannot be seen on a formal organizational chart, it represents how contemporary organizations actually function.

¹ Nicholas G. Carr, IT Doesn't Matter, *Harvard Business Review*, May 2003, p. 5.

² Does IT Matter? An HBR Debate, Letters to the Editor, *Harvard Business Review*, June 2003, p. 1.

³ Research conducted through The Network Roundtable (www.networkroundtable.org) has now assessed over 100 organizations and has never once seen an internal or external database or the Internet come anywhere close to colleagues as key sources of information to get work done.

Only in the last decade or so have methodologies to study these relationships and informal information flows begun to be applied as a management tool. Research into social networks has uncovered many specific leverage points for managers to enhance collaboration, innovation, leadership, client relationships, and other key domains⁴. The research presented in this report has adapted this approach in a unique way to assess effective technology-purchasing decisions.

The formal and informal decision-making processes of large organizations that guide technology-purchasing decisions reflect only a small part of the reality of how these decisions are made. Decisions are made based on information and influences from key people inside and outside the organization. Organizational network analysis (ONA), with appropriate adaptation, is admirably suited to uncovering technology purchase influence networks inside organizations and understanding how to optimize their effectiveness.

Key findings

This research identifies the influence networks most likely to produce successful decisions. It also describes what kind of information from which sources should be sought, avoided, or critically assessed.

Five prominent lessons emerged from the overall research:

- **The archetype for a successful purchasing decision is based on a strong IT Director/ IT Manager relationship that is well aligned with business executive roles.** The strongest characteristic of successful purchasing decisions is a central strong nexus between the IT Director and IT Manager roles, when these roles are supported by business (non-IT) executives. This configuration appears to support effective decisions by integrating the primarily strategic (IT Director) and operational (IT Manager) perspectives of these roles, while ensuring that these are informed by business requirements. This configuration also provides clear primary roles for the decision-making process that effectively coordinate input from across business and IT roles. In contrast, with unsuccessful decisions, there is less coordination between the IT Director and IT Manager roles. Instead, other less appropriate roles are more central to the decision. Although this pattern is consistent across organizations, it is usually not visible or recognized because it is a function of internal relationships. This observation highlights the value of the network analysis, as it shows what determines decision success is how roles function together rather than individually. To apply this finding, organizations should define specific decision roles and collaboration points in their internal decision-making processes. If designed effectively, this process will ensure the involvement of key roles without creating bureaucratic overhead.
- **Input from selected external parties supports successful decisions.** Outside input, most notably from industry peers and former colleagues, helps to ensure a successful decision. Primarily in the form of informal experiences and lessons

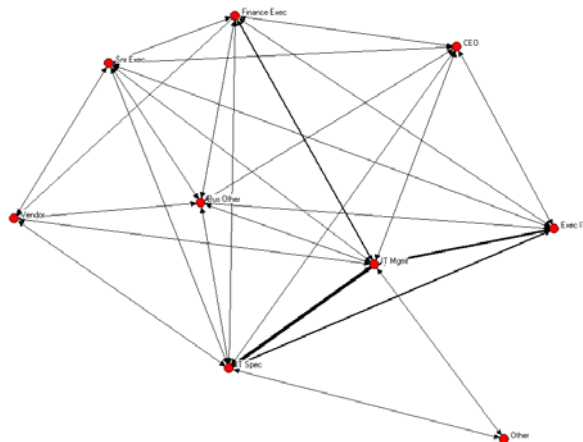
⁴ See *The Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organizations*, Rob Cross and Andrew Parker, Boston: Harvard University Press, 2004.

learned, this outside advice presumably helps ground decision makers in the reality of an implementation. For IT managers and executives, this finding emphasizes the importance of an active professional network that includes non-biased associations and industry colleagues in similar roles in other organizations. Some organizations include network development practices with career management processes to ensure these diverse networks are built and available when needed.

- **Involvement from other external parties, especially vendors, yields mixed results.** When the vendor is relied on too heavily, decisions tend to be unsuccessful. In these scenarios, it is likely that a purchaser bought too heavily into the anticipated benefits of the technology without factoring in challenges that other voices might have pointed out. In fact, some kinds of vendor input led to unsuccessful outcomes. In general, input from the vendor's lead sales executive and value-added resellers was prejudicial to decision success, whereas input from technical specialists at the vendor was neutral or positive. It is important to note that successful decisions drew on the full range of vendor roles. This suggests that establishing policies for interacting with a vendor to obtain the full range of necessary information and perspectives can improve the quality of a decision (in particular if that information is passed on to a strong IT Director/IT Manager nexus).
- **Unbalanced involvement of IT Technical Support is strongly correlated to unsuccessful decisions.** In general, IT Technical Support roles are unlikely to have the breadth of experience across technology implementation and business user requirements that would enable strong input into technology-purchasing decisions, other than on specific technical issues. The reason this role figures so prominently in decision making is probably its visibility and accessibility in the organization. As indicated above, defining roles in the technology-purchasing decision making helps to ensure that those with appropriate expertise and experience provide relevant, value-added input to decisions.
- **Getting financial and business input from the CFO strongly supports decision success.** A CFO's most valuable contribution to the decision-making process is financial and business analysis. Although this is not surprising, it is intriguing to see that financial and business analysis input is often provided by non-finance roles, including IT Technical Support and vendor sales executives. It is also important that input from the CFO and Finance Manager is provided to the executives who are most central to the decision process, rather than those at the periphery, or those who do not have the experience or skills to consolidate internal perspectives on the decision at hand.

The combined networks for successful and unsuccessful decisions (showing only the most significant connections) are contrasted in Figure 1. The two networks are contrasted and analyzed in greater detail later in this document; several key features stand out immediately. The highly balanced roles of IT Director and IT Manager in successful decisions are underlined by how most other significant roles are directly linked to both of these players. They provide a focal point for input to the decision process from across the organization. A wide range of senior business and technical roles feed into this central nexus. In contrast, in unsuccessful decisions, there is no clear central nexus, business roles are not represented, and the predominant connection is between the IT Manager and IT Technical Specialist.

Combined network of all successful decisions, with aggregated job roles (n=130 responses).



Combined network of all unsuccessful decisions, with aggregated job roles (n=38 responses).

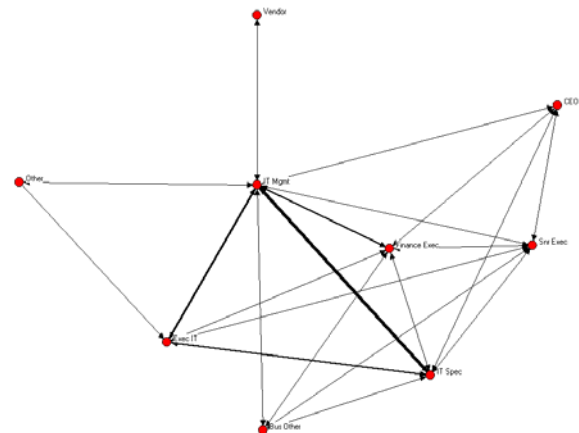


Figure 1: Comparison of successful and unsuccessful purchasing decisions. The width of the connecting line represents the strength of the relationship.

This study clearly shows that the configuration and operation of influence networks have a major impact on the success of technology-purchasing decisions, revealing several prominent implications for senior managers. Successful technology-purchasing decisions can be supported simply by clearly defining and carefully allocating the roles involved in the decision-making process. People who have the expertise, communication skills, and existing internal networks must take on these roles. Addressing this issue alone can significantly improve decision outcomes. It is also possible to create a slightly more structured approach to decision making by defining key decision concerns and identifying the optimal sources and formats of information to address these concerns. These guidelines are not a one-size-fits-all solution, but they do lead to a more effective use of available information and expertise in the decision-making process.

Organizations also may find it valuable to apply network analysis directly to their own decision-making teams and processes. Network analysis can be used to assess the influence networks currently in place in the technology-purchasing process and to compare them with the templates of successful and unsuccessful decision networks uncovered in this study. More generally, network analysis can help identify specific interventions that will support both better communication within the IT group and between business and technology staff.

Research design

To understand the decision-making process, we surveyed IT and business professionals who had participated in major technology-purchasing decisions within at least 3 months but fewer than 12 months previously. This allowed the decision process to be fresh in mind.

We used two key frameworks for understanding the decision process:

- Identify the key participants in the decision process and the patterns of influence between them in making the decision.
- Identify the primary concerns that needed to be addressed in order to reach a decision and what types of information, from which sources inside and outside the organization, were used to address those concerns.

The study covers purchasing decisions for four types of technology:

- Voice over IP (VoIP)
- Enterprise software (i.e., ERP or CRM)
- Storage
- Servers

Data analysis

The survey generated both independent data and relational data. The independent data (e.g., demographics, decision concerns, information sources) are examined in the last section of this report, using standard methodologies. The relational data described the relationships involved in the purchasing decisions under study. These relational data were analyzed using the network analysis tool UCINET and the visualization tool NetDraw.⁵ The approach allowed us to apply a range of network analytics to the data and to generate the network diagrams shown below.

Interpreting network diagrams

The study generated a range of network diagrams (visual representations of the links between participants in the decision-making process). Each of these diagrams combines the roles and connections involved in a set of individual decisions into a single network diagram. Creating this combined view across all respondents gives us strong insights into the underlying characteristics of successful and unsuccessful decisions and the differences between them.

⁵ Both tools are available from Analytic Technologies, at www.analytictech.com.

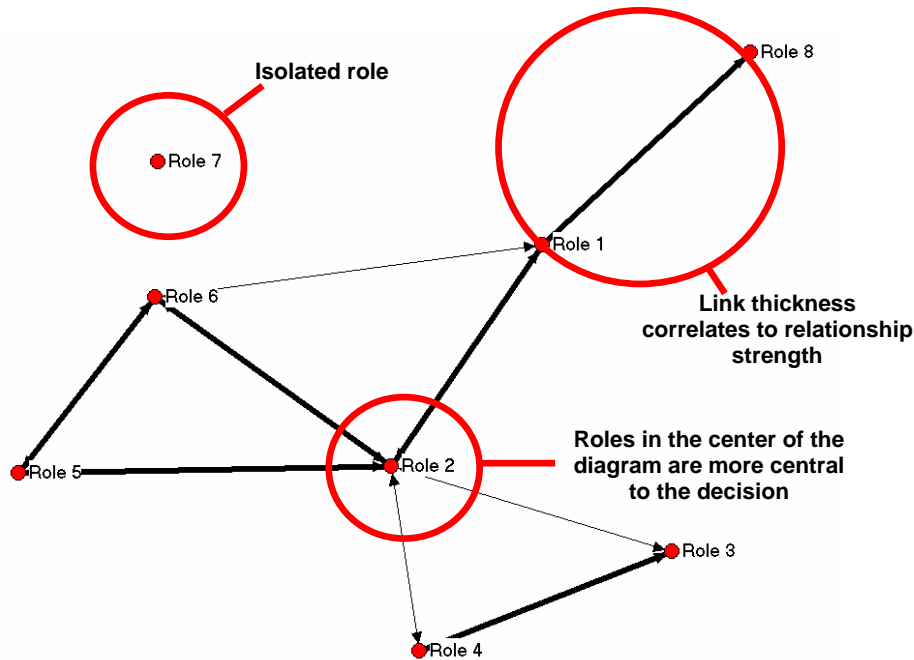


Figure 2: Sample network diagram.

The sample network diagram in Figure 1 shows the key aspects to look for in the diagrams that follow. The network diagrams are constructed so that the roles with the most connections in the network are placed in the center of the diagram, whereas those more peripheral to a decision are situated at the edge of the diagram. This can be seen in Figure 2, where Role 2 is most central to the network.

The thickness of the line between any two roles shows how frequently one role turns to another for information or problem solving in relation to a key decision. Thicker lines indicate more connections. In some of the network diagrams that follow, only those links that occur a minimum number of times across the combined networks are shown, to simplify the view of the decision-making network.

Decision networks

The research analyzes the network configuration of participants in the decision-making process and the sources of information they used to make their decisions. The decision network analyses below apply only to those survey responses where a team or committee was responsible for making the decision and the number of employees in the organization was at least 100.

In this section, we look first at the patterns of all successful decisions made, then at the characteristics of all unsuccessful decisions, drawing out insights on the key differences between successful and unsuccessful decisions. We then examine in more detail purchasing decisions for enterprise software and servers to uncover the key characteristics of successful and unsuccessful decisions for each of these two specific technology categories.

Successful decisions

The majority of purchasing decisions made (76%) were deemed to be successful by the study participants. This section examines the influence networks for successful decisions across all technology-purchasing categories, examining first the networks between each individual job role and then the networks between aggregated job roles, where job roles are combined into groups based on seniority and function.

Combined networks with all job roles

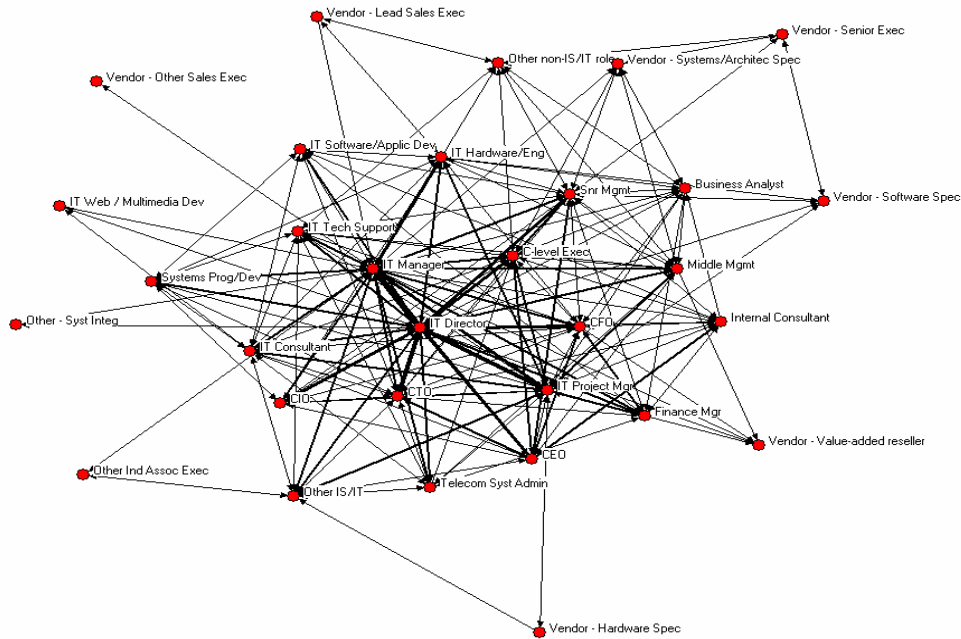


Figure 3: Combined network of all successful decisions (n=130 responses).

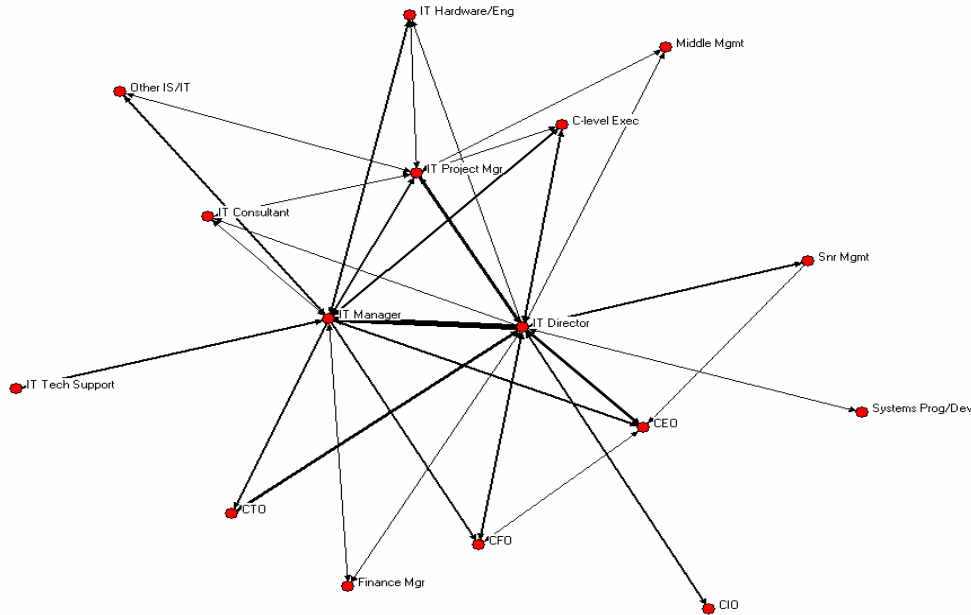


Figure 4: Combined network of all successful decisions, showing only links where there are five or more ties (n=130 responses).

Figures 3 and 4 show the combined networks for successful decisions. One of the key findings is that the IT Director and IT Manager are jointly central to successful decisions.

The CEO, CFO, and other C-level executives are all connected to both of the two central roles, rather than just the IT Director. Interestingly, the CIO and CTO are somewhat more peripheral to the decision. The IT Project Manager plays a central role among IT staff involved in the decision-making process.

Combined networks with aggregated job roles

To provide further insights into the configuration of these networks, we aggregated the 39 job roles into nine categories:

Aggregated roles

Chief executive

- CEO

Business

- **Senior Executives:** Other C-level executives, Senior management
- **Finance Executives:** CFO and Finance Manager
- **Other Business:** other Business staff

IT

- **Executive IT:** CTO, CIO
- **IT Management:** IT Director, IT Manager, IT Project Manager
- **IT Specialists:** Other IT staff

Other

- **Vendor:** all Vendor staff
- **Other:** all individuals external to the organization other than vendors

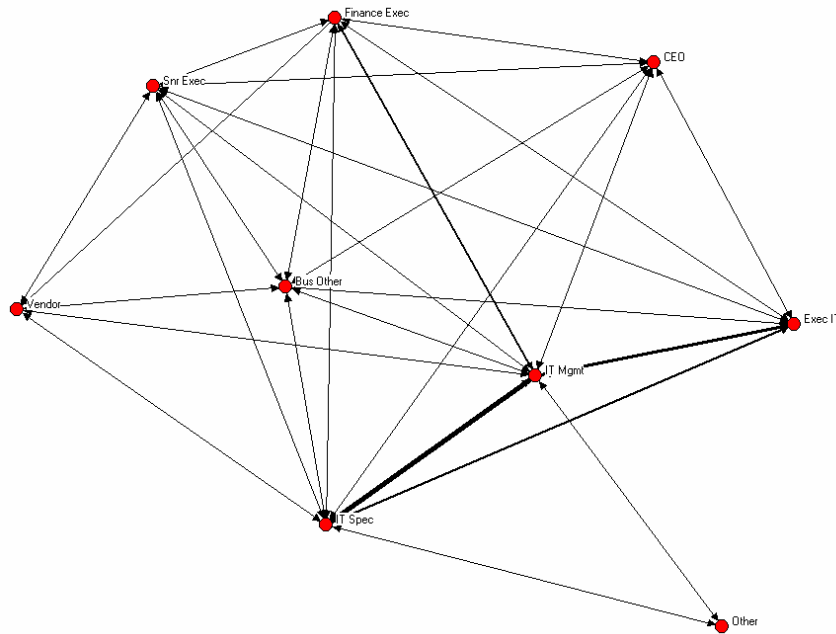


Figure 5: Combined network of all successful decisions, using aggregated roles (n=130 responses).

The primary links shown in Figure 5 are all among IT roles, with IT Management most central and tied to both Executive IT and IT Specialists. The CEO's primary connection is with IT Management rather than with Executive IT. Similarly, Finance Executives, Senior Executives, and Other Business roles are more closely tied to IT Management than anyone else, including the CEO and other Senior Executives. The centrality of the Other Business role (which is primarily middle and junior management) in successful decisions highlights that in the decision-making process, business end users should be involved not only in discussions with technology staff, but also with other business executives, including top management and finance executives.

Unsuccessful decisions

A relatively small proportion of decisions made (19%) were considered to have been unsuccessful by respondents. However, this still provides a sufficient pool to gain insights into the characteristics of these decisions. Here we examine the influence networks underpinning unsuccessful decisions, again across all job roles, and then using the aggregated job roles as defined above.

Combined networks with all job roles

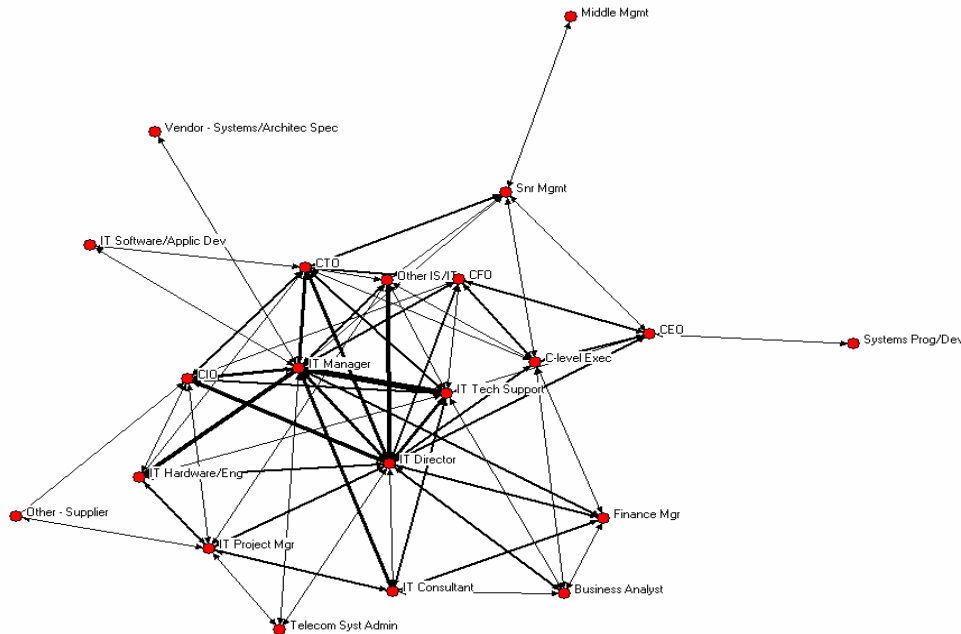


Figure 6: Combined network of all unsuccessful decisions (n=38 responses).

In the unsuccessful decisions studied, in Figure 6 the IT Director can be seen to be the single most central role; however, the predominant relationship in this configuration is between IT Management and IT Technical Support. Business roles are marginalized, a point that becomes particularly clear in Figure 7, which shows there are literally no business roles with significant involvement.

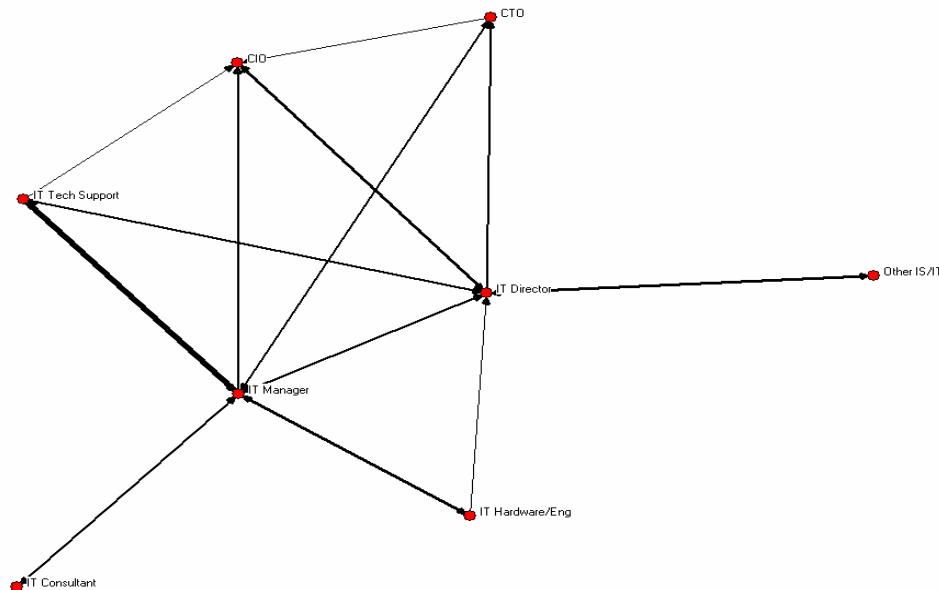


Figure 7: Combined network of all unsuccessful decisions, showing only links where there are three or more ties (n=38 responses).

Combined networks with aggregated job roles

In consolidating the view of the network to the aggregated job roles, as shown in Figure 8, the decision nexus is predominantly between IT Management and IT Specialists, with other ties underrepresented relative to successful decisions. With the exception of Finance Executives, business roles are at the periphery.

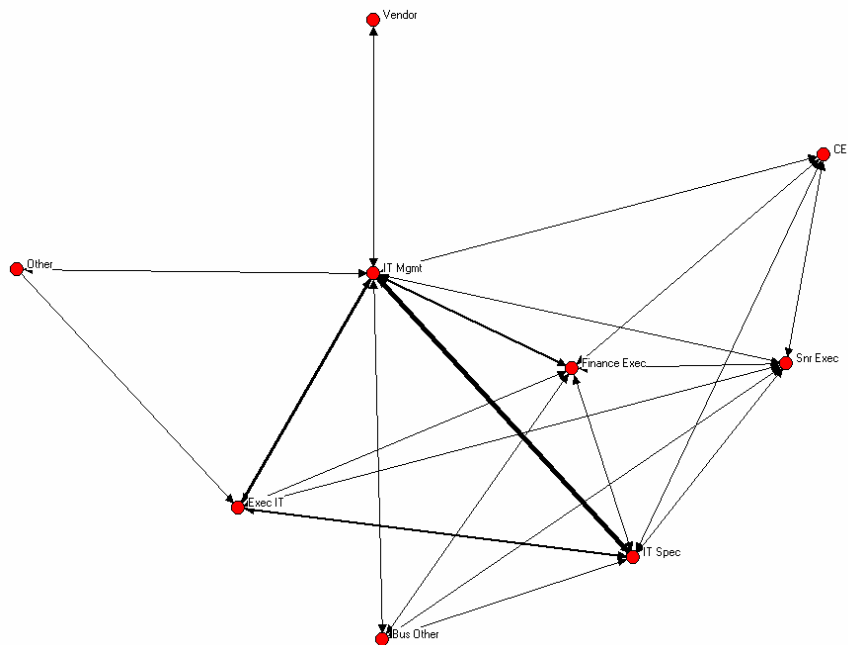


Figure 8: Combined network of all unsuccessful decisions, using aggregated roles (n=38 responses).

Successful versus unsuccessful decisions

Detailed quantitative analysis of the decision-making configurations for successful and unsuccessful networks yields these insights. Specifically, in unsuccessful decisions, there is the following:

Overinvestment in communication between

- Executive IT
- IT Management
- IT Specialists

Underinvestment in communication between IT Management and

- CEO
- Senior Executives
- Other Business roles

In addition to the analysis of successful decisions across all technology categories, it is also worth highlighting some of the detailed findings in studying purchasing decisions made for enterprise software and servers.

Decisions by technology purchase type

The influence networks that apply in purchasing decisions vary depending on the type of technology. Each category of technology requires a different array of executives from IT, business, and outside the organization to be involved and to communicate effectively. To move into more detail on the influence networks in technology-purchasing decisions, we now analyze the networks for successful and unsuccessful decisions for two key technology categories: enterprise software and servers.

Enterprise software

Purchasing decisions for enterprise software such as ERP and CRM typically have a greater involvement of business roles, as the purchase will have a very direct impact on business processes and activities. Here, we examine the aggregated roles.

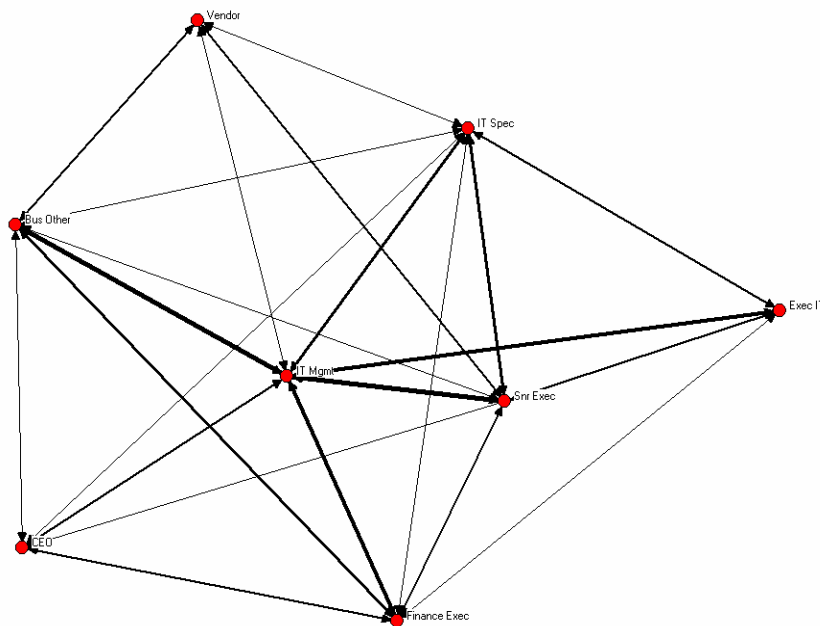


Figure 9: Combined network of all successful decisions for enterprise software, using aggregated roles (n=19 responses).

The primary nexus in successful enterprise decisions, illustrated in Figure 9, is between IT Management and Senior Executives. Senior Executives are far more central than for other decision types and correspondingly are tightly linked to all levels of the IT operation as well as to the Vendor and Finance Executive. This reflects the reality that selecting enterprise software is a strategic decision for organizations. Senior business executives need to implement software that will be aligned with their current and anticipated business processes. It is interesting to note that IT Management (mid-tier IT executives) play a more central than in decisions for other types of technology, with Executive IT being less central. This may be due to the substantial and detailed work required in interfacing with business in order to assess different solutions. This work falls primarily to IT Management. The network shown here for the successful enterprise software decision suggests not only an appropriate configuration of organizational resources, but also strong, diverse networks of IT Management. In order for this successful network

configuration to be implemented in practice, the staff in IT Management roles needs to have excellent internal connections and communication skills in order to liaise with the array of roles required, from IT Specialists to Finance Executives and the CEO.

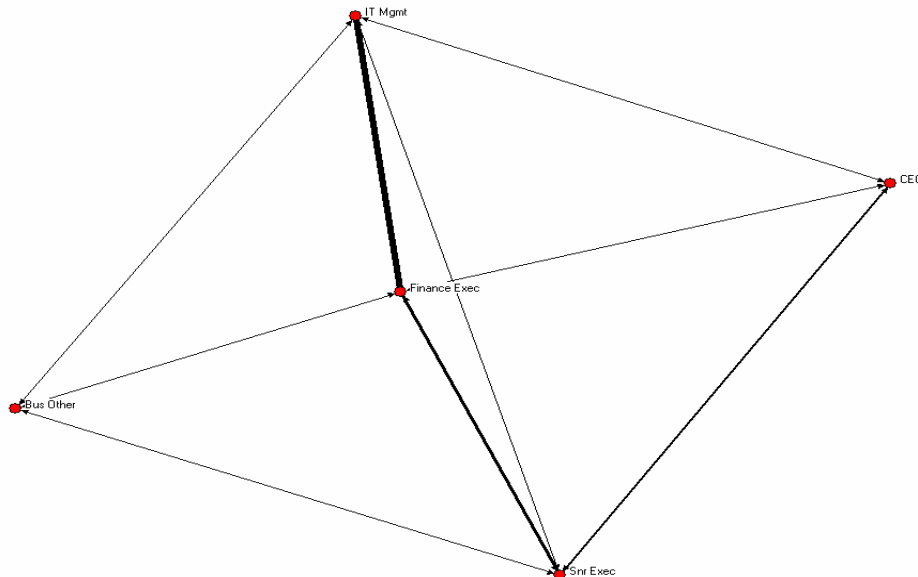


Figure 10: Combined network of all unsuccessful decisions for enterprise software, using aggregated roles (n=4 responses).

In contrast, in unsuccessful enterprise software decisions, shown in Figure 10, Finance Executives are the most central in the network. Senior Executives are involved in the decision process but are relatively distant from IT Management, and there is no significant Executive IT involvement. Successful enterprise software decisions require a wide range of roles within the organization to be involved, with the most central roles played by staff members who can communicate effectively on business, technical, and financial issues. It is not surprising that the central position of the Finance Executives in this configuration has led to unsuccessful outcomes.

Lessons for organizations making decisions on implementing enterprise software include ensuring that Senior Management roles are substantially involved in the decision process and that Finance Executives, although communicating with all key participants, are not too central to the decision. Perhaps most importantly, IT Management roles need to be defined as central to the decision-making process. It is critical not only that they have the ability to communicate effectively with the full range of business, technical, and financial roles, but also that they have strong internal networks in the organization. Recent hires into this role may not have the diversity and strength of connections to be fully effective. Executive IT should make it a priority that members of IT Management have the skills, support, and rewards to actively develop their internal networks.

Servers

Servers are central to IT infrastructure; however, the technology and its implementation should remain largely invisible to business users. This affects the nature of the networks

supporting successful server purchasing decisions. In examining server purchasing, we analyze the network at the level of individual roles.

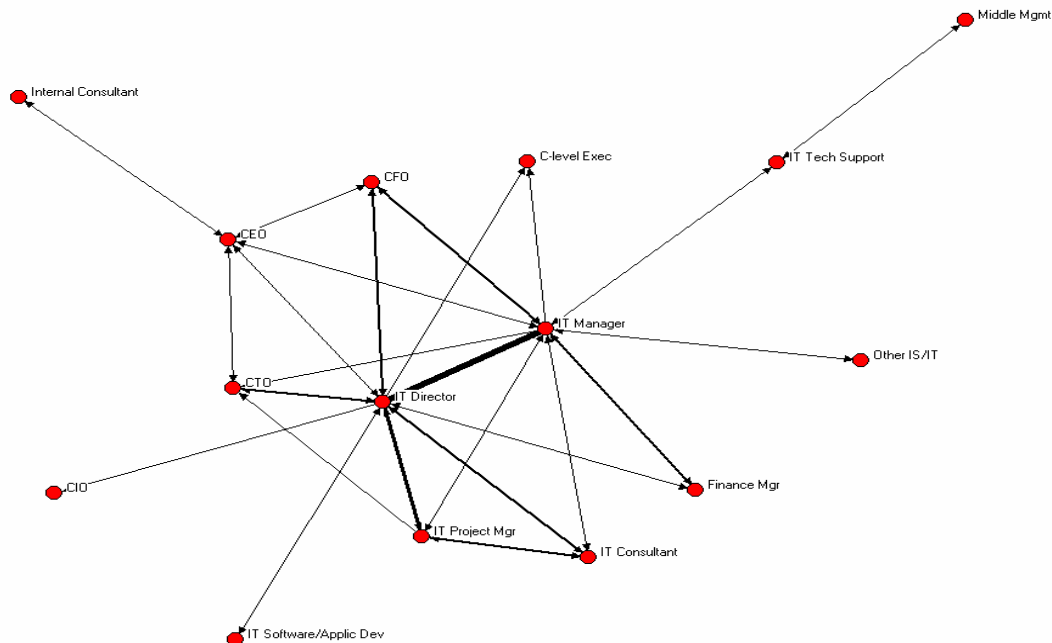


Figure 11: Combined network of all successful decisions for servers, showing only links where there are three or more ties (n=72 responses).

In the successful server decision shown in Figure 11, the IT Director to IT Manager nexus is predominant. This largely reflects the configuration for successful purchasing decisions across all technology categories. The CEO and CFO are both equally linked to the IT Director and IT Manager, with the CEO also connected to the CTO. IT Technical Support is peripheral to the decision. For a primarily technical decision, the overall configuration is balanced, with IT Director and IT Manager roles clearly having complementary roles in the decision process and both being linked to all other key players. Note that this diagram shows only those links where there are three or more ties, so all of these links can be considered strong.

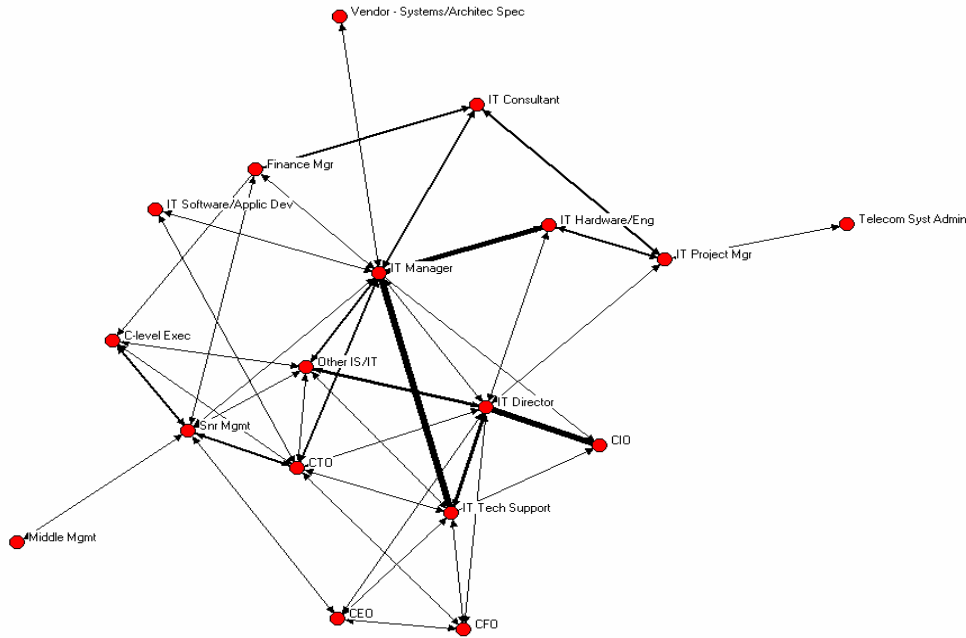


Figure 12: Combined network of all unsuccessful decisions about servers (n=21 responses).

The unsuccessful decisions about servers show a number of interesting patterns and contrasts to the successful decisions. The primary nexus, shown in Figure 12, is that between IT Manager and IT Technical Support, whereas IT Technical Support played only a peripheral role in the successful decisions. Not only is IT Technical Support the strongest link to the IT Manager, suggesting strong involvement in providing technical input, but IT Technical Support is also very widely connected to other key roles, including all of the C-level executives. There is no clear rationale behind the centrality of this role, which may be supported simply by its visibility in the organization.

The CEO and CFO are completely unconnected to the IT Manager and only marginally connected to the IT Director. These are very significant gaps in the decision-making network. The CEO and CFO should be involved in these decisions and receive input from people who are both central to the decision-making network and have the appropriate skills to consolidate perspectives on the purchasing decision.

The CIO plays a considerably stronger role than in the successful decisions, with a strong link to the IT Director. However, the CIO continues to lack connections to business roles.

The IT Project Manager is considerably more peripheral than in the successful decision, is not connected to the IT Manager, and is marginally connected to the IT Director. The skills and internal networks of the typical IT Project Manager are well-suited to playing a secondary central role among IT staff; this has been tapped in the successful network but not the unsuccessful network.

The Finance Manager is also considerably more peripheral to the server solution decision, with no ties to senior technology roles. This contrasts to the Finance Manager in the successful role, which is tied directly to the two most central technology roles in the decision.

For decisions that are primarily technology-driven, the implications are that the key responsibilities should be defined and allocated to central IT roles, probably IT Manager and IT Director. Communication with business and financial roles should be directed primarily to these roles, as they are best positioned to consolidate the key information and issues.

Conclusion

Our novel application of ONA to the process of technology purchase decision-making has provided clear views of the relationship models most correlated with successful decisions and unsuccessful ones. The most successful decision network model has a strong central connection between the IT Director and IT Manager roles, who are also well aligned with business executive roles.

Additional findings

Decision concerns and decision inputs

To provide context and further detail to the decision networks study, we asked participating organizations to assess the most important factors in the decision-making process. We used these responses to identify what types of information inputs, from which sources, were used to address these concerns.

The four outstanding decision concerns nominated were the following:

- Vendor quality/reliability
- Fit with corporate or IT strategy
- Integration issues
- ROI

Interestingly, there was significant variation on the relative importance of these issues across the types of technology decisions, as can be seen in Figure 13. Vendor quality and fit with strategy were predominant for storage and server purchases, whereas ROI was the primary concern for VoIP and enterprise software decisions. Integration issues were important for all decision categories.

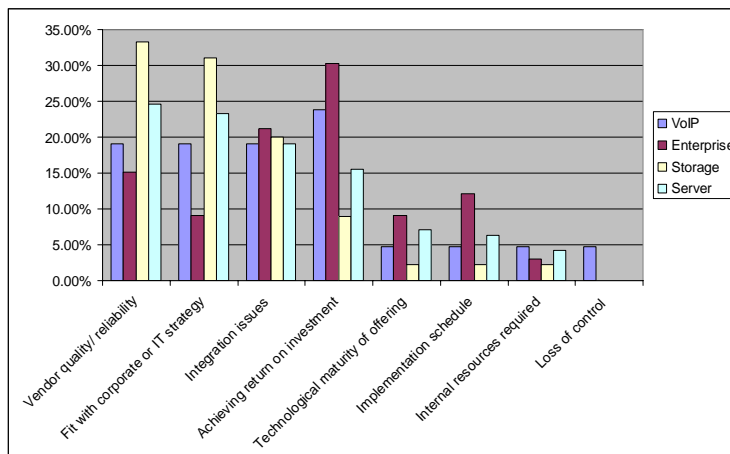


Figure 13: Primary decision concerns for purchasing each type of technology.

A wide variety of information sources were used in making effective decisions, as shown in Figure 14. Across all decision concerns, people within the same department were the most important source of information, followed by a wide variety of human and data sources inside and outside the organization.

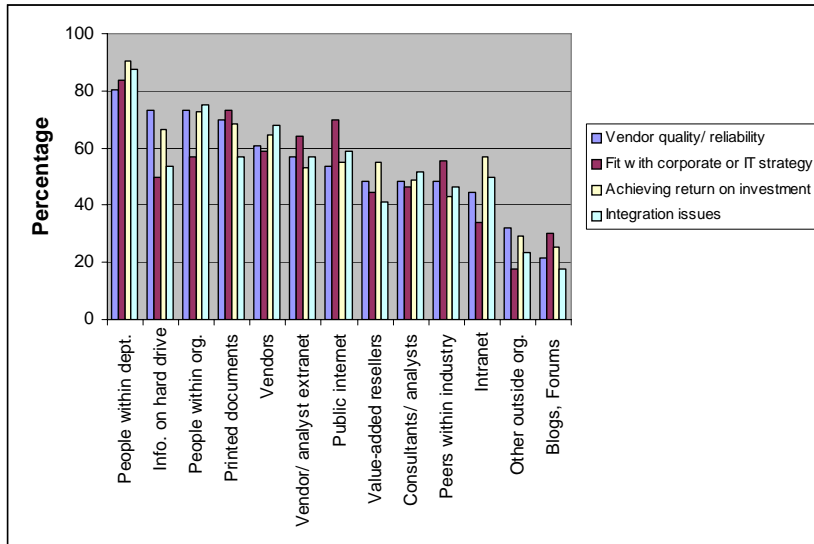


Figure 14: Information sources used to address decision concerns.

The most important types of inputs provided to decisions were informal experiences and lessons learned, technical analysis, final recommendations, and raw data, as illustrated in Figure 15. The profile of inputs to VoIP decisions was different from those for other technologies, notably relying more on case studies, analyst reports, and financial analysis, and less on informal experiences and vendor information.

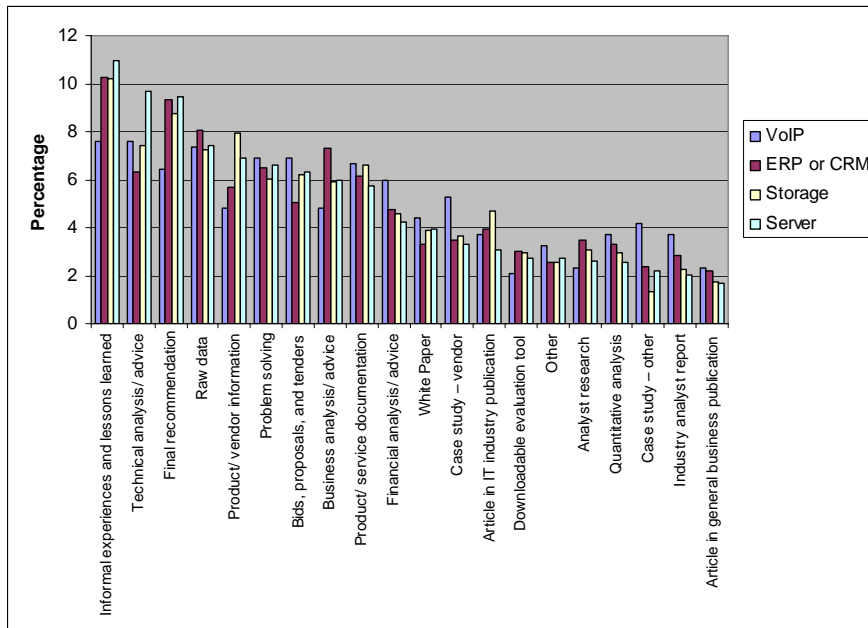


Figure 15: Types of inputs to decision making for each technology decision.

In addressing the key decision concerns, there were significant findings in how the use of information sources impacts decision success. Figure 16 illustrates how this is the case for decisions where vendor quality and reliability is the primary concern. Unsuccessful decisions relied too heavily on IT internal roles. Successful decisions had significant input from people outside the organization, not including vendors (primarily industry peers and former colleagues).

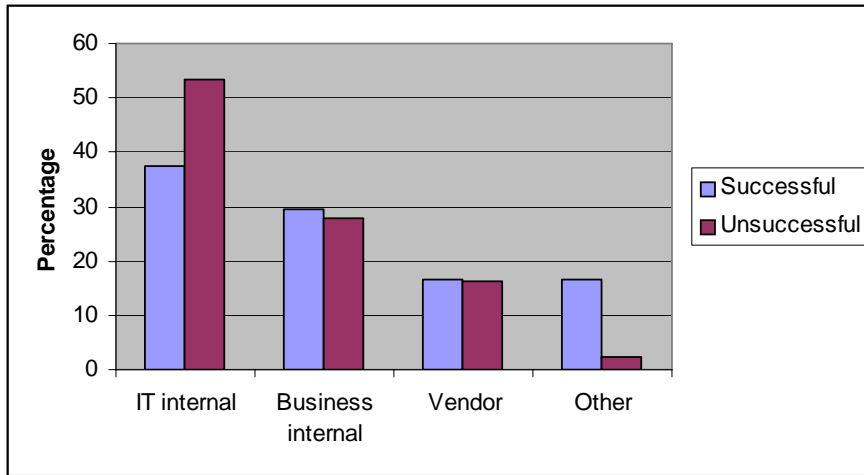


Figure 16: Information sources used to address Vendor quality/reliability as a decision concern.

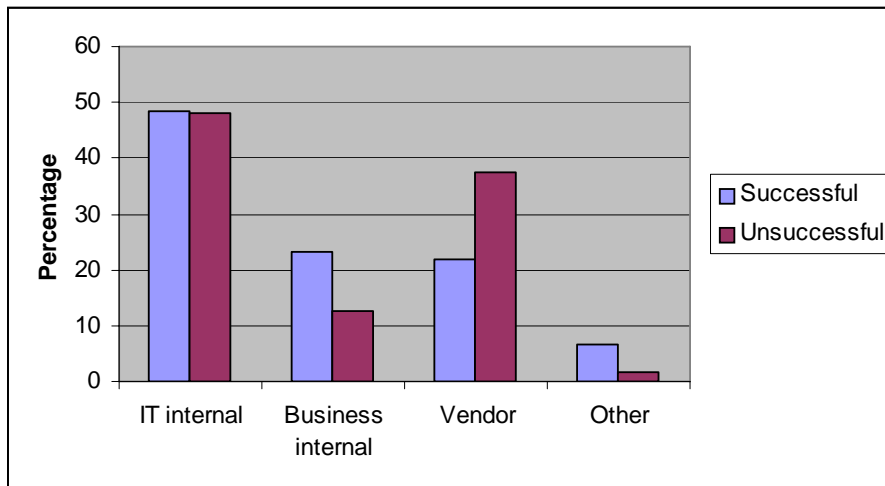


Figure 17: Information sources used to address Integration issues as a decision concern.

Decisions where integration issues were the primary concern were more successful if they had significant input from business roles. Decisions that relied too heavily on vendors tended to be unsuccessful, as illustrated in Figure 17.

Other analyses showed that the source of various decision inputs had a strong bearing on decision success.

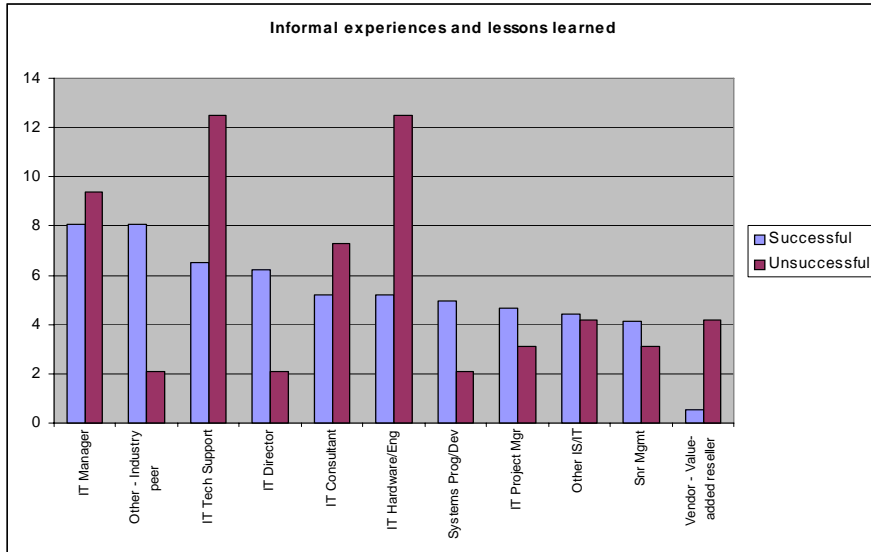


Figure 18: Source of informal experiences and lessons learned for successful and unsuccessful decisions.

The single most accessed information source for decisions was informal experiences and lessons learned. The source of this input was a significant determinant of decision success, as can be seen in Figure 18. Getting informal experiences from industry peers was strongly correlated to decision success, as was input from the IT Director. However, input from IT Technical Support, IT Hardware Engineers, and Value-Added Resellers proved to be potentially dangerous.

Demographics

The survey was completed by 289 respondents working in U.S. corporations. The majority of respondents worked in IT roles, as indicated in Figure 19, with a significant number of respondents in senior business roles also. Fifty percent of responding organizations have annual IT budgets of \$500,000 or greater, and 28% have budgets of \$10 million or more, as shown in Figure 20.

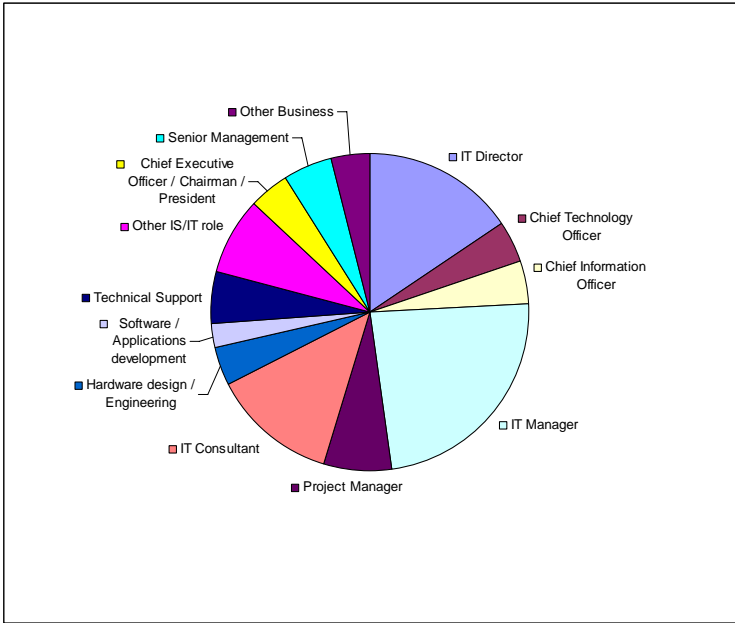


Figure 19: Roles of survey respondents.

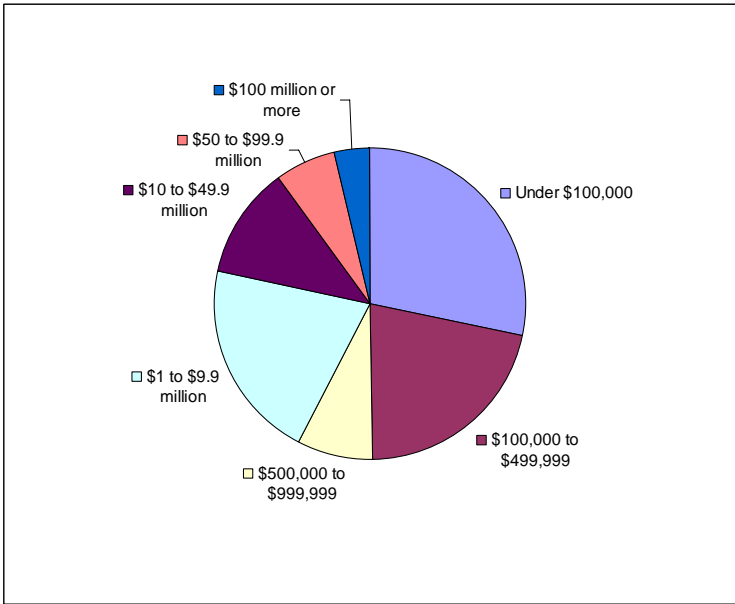


Figure 20: IT budgets of participating organizations.