

The Innovation Process: Practices in Food and Agribusiness Companies

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The Innovation Process: Practices in Food and Agribusiness Companies

by Maud Roucan-Kane, Dr. Allan Gray, Dr. Benjamin Gramig, and Dr. Michael Boehlje

Introduction

Brown and Teisberg (2003; p1) stated that "Innovation is the lifeblood of successful businesses. [...] [It] has become every firm's imperative as the pace of change accelerates." Executives acknowledge the strong need for innovation; they are still challenged by translating great ideas into revenue sources (Huurainainen, 2007). Figure 1 presents a framework that summarizes some of the theories that have been brought forward to help executives deal with this challenge. Cross-functional teams have been defined in the literature as a group of people with different functional specialties or skills that are responsible for carrying out all phases of the innovation process. The innovation literature has been advocating the use of cross-functional teams to allow for a smoother and higher-performing innovation process (e.g., Cooper et al., 2004; Christensen et al., 2004). In addition, numerous R&D project selection methods such as graphical analyses, structured assessments, and economic models have been proposed to help organizations. The ultimate goal of cross-functional teams and selection methods is to assist companies in their innovation process and help them achieve a portfolio of innovation projects that is diversified.

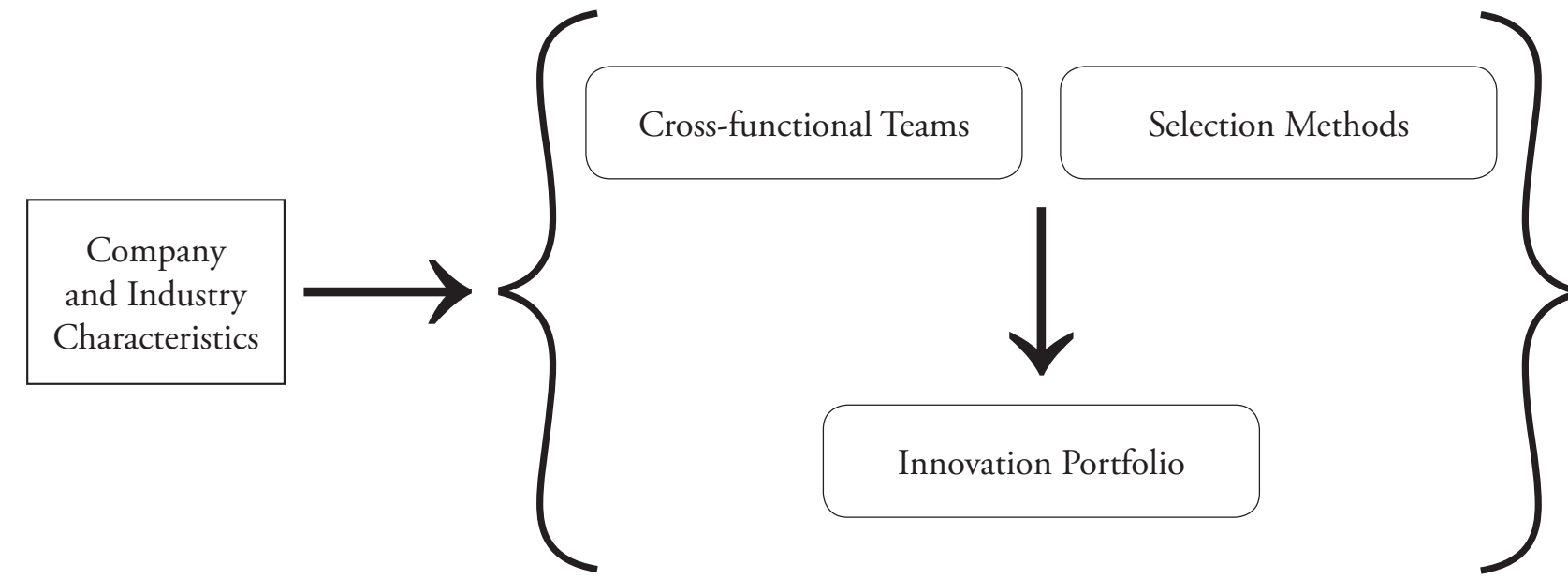


Figure 1. A Conceptual Framework for the Innovation Process

The Survey

The survey was created and administered online using software called Qualtrics. The survey was extensively pre-tested with different people of diverse expertise. It was administered in December 2009 and sent out to 849 top executives of agribusiness companies. The survey included a number of questions about the innovation process (the functional areas and the selection methods used), the portfolio, and the company. 136 people filled out the survey, resulting in a response rate of 16%. Of the 136 surveys, 109 surveys were usable. These respondents represented several ag sub-industries, revenue ranges, governance structures, and scopes.

Cross-functional Teams

Respondents were asked to select all the functional areas involved in the selection of innovation projects for their company. The categories offered to them were executives, marketing, research and development (R&D), sales, and other. The results are presented in Figure 2. On average, respondents selected 3.36 functional areas (out of 5) suggesting the existence of somewhat cross-functional teams with the most likely pairs being sales and marketing (correlation of .285) and executives and marketing (correlation of .226). Nonetheless, seven respondents reported involving only one functional area (R&D or executives) in the selection process.

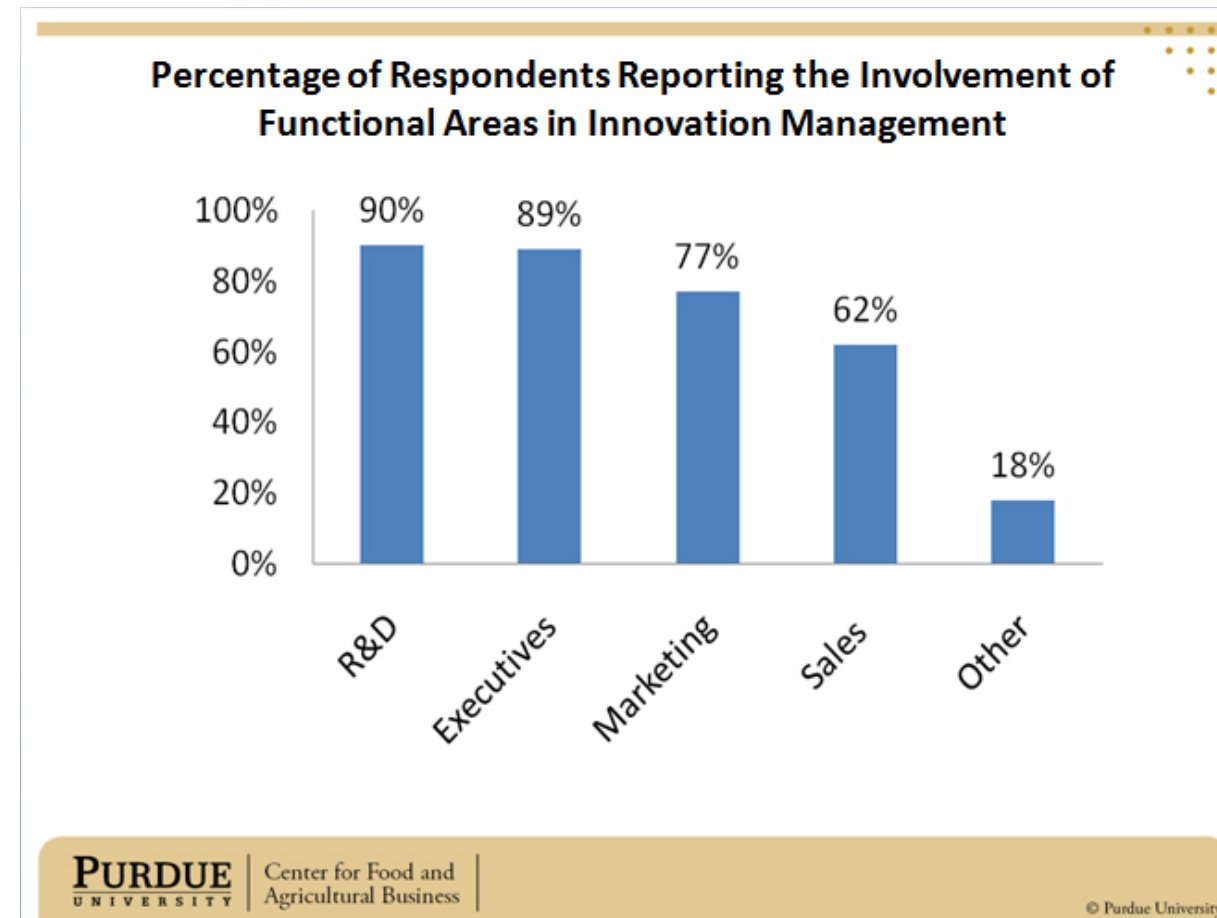


Figure 2.

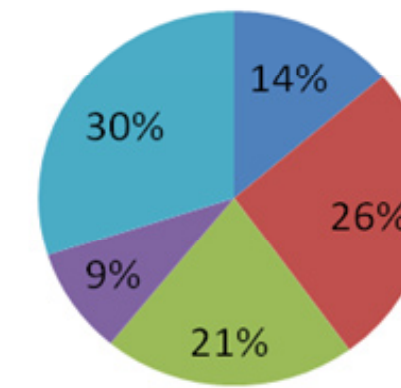
Figure 2 hides some significant differences by company and industry characteristics. Specifically, the sales department is more likely to be selected by smaller firms (in terms of revenue, scope, and governance structure) likely because smaller firms tend to be more sales focused. Surprisingly, firms committed to innovation differ from other companies only by the fact that they are less likely to involve the sales department maybe because they are concerned that sales representatives will be biased by being too short term and sale focused.

The table below provides five different levels of uncertainty in the potential return of innovation projects. What is your estimate of the proportion of your company's R&D budget that is invested in projects at each level of uncertainty?

Probability of Potential Return	% of your R&D budget		
Above	Near	Below	
25%	50%	25%	%
60%	15%	25%	%
50%	25%	25%	%
33%	34%	33%	%
50%	0%	50%	%

Distribution of Potential Return

■ 33%, 34%, 33% ■ 50%, 25%, 25% ■ 25%, 50%, 25%
■ 50%, 0%, 50% ■ 60%, 15%, 25%



What are the percentages of your company's product innovation projects with:

Low risk of technical failure:	%	High risk of technical failure:	%
Exclusively or primarily in-house capability:	%	Partner capabilities:	%
Short-term to market:	%	Long-term to market:	%
Low proportion of the total budget already committed:	%	High proportion of the total budget already committed:	%

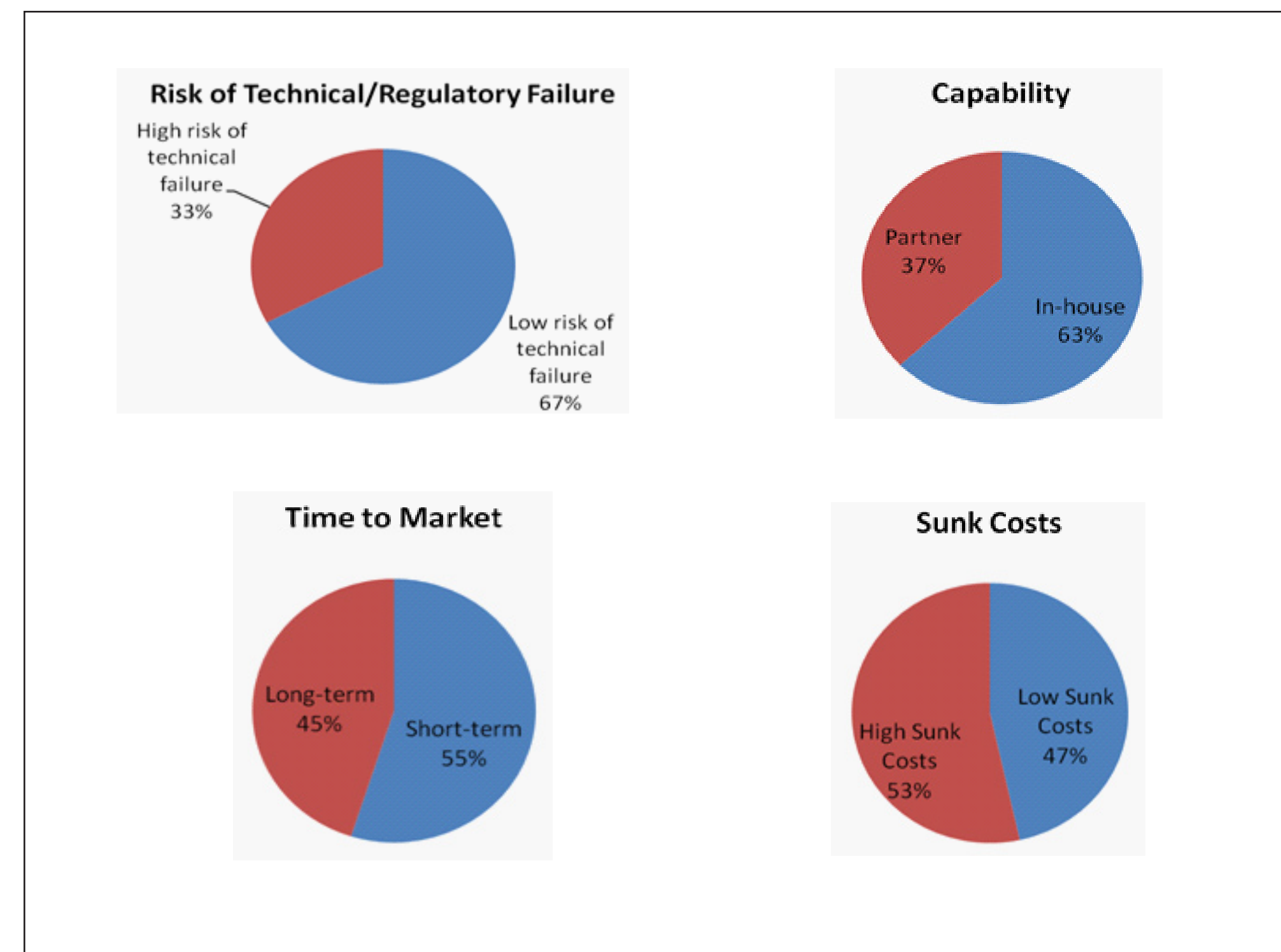


Figure 4. Innovation Portfolio of Food and Agribusiness Companies

References

Brown, J. S. and E. Olmsted Teisberg (2003). "Options Thinking for Leading Innovation." *University of Virginia, Darden School of Business*.
Christensen, C. M., S. D. Anthony, E. A. Roth (2004). "Seeing what's next: Using the Theories of Innovation to Predict Industry Change." Harvard Business School Press, Boston Massachusetts.
Cooper, R.G., S. J. Edgett, E. J. Kleinschmidt (2004). "Benchmarking best NPD practices—II." *Research-Technology Management*, 47 (3), 50–59.

Selection Methods

Figure 3 shows the distribution of answers to the question "Which of the following portfolio management selection methods best describe your company's primary selection process? (Please check the 3 most important methods.)" The majority of the respondents (53%) selected 3 methods, 23% selected 2 methods, and 24% selected 1; resulting in an average of 2.27 selection methods. Nonetheless, 23% of the companies rely on one method: 12% reported using only informal methods; 6% checked only economic models; 5% selected only structured assessments.

Smaller firms (in terms of revenue) use more informal methods, while larger firms use more economic and structured methods maybe because of differences in resources. Publicly traded firms are more likely to use economic models and structured methods and less likely to use informal methods, potentially because of the shareholder's interest for dividends. Surprisingly, firms committed to innovation do not differ from firms not committed to innovation, which was not expected.

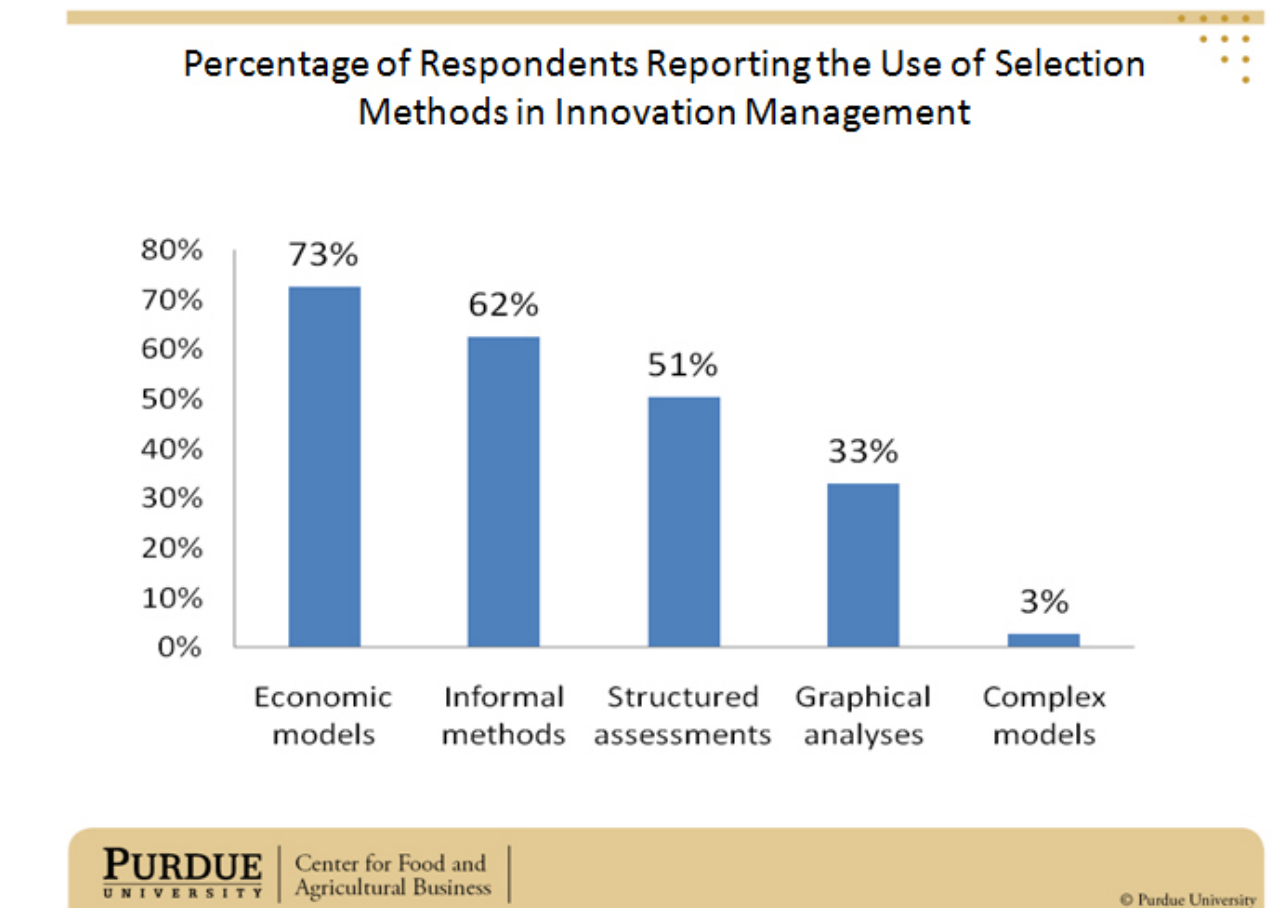


Figure 3.

The selection process is also found to be different by sub-industry. The food sub-industry is less likely to use graphical models. The crop protection sub-industry is more likely to use economic models, while the animal nutrition sub-industry is more likely to use graphical methods and less likely to use structured methods. The animal nutrition sub-industry also tends to use more selection methods. A discussion of these results with an executive in the food and agricultural sector suggests that the food sub-industry tends to focus on incremental innovation (e.g., a line extension), which is not too risky and may not require complex, formal analyses. In animal nutrition, products are often regional and may not justify lengthy analyses. Finally, crop protection is highly regulated and approvals are expensive and time consuming, which may explain the additional emphasis on modeling.

Characteristics of the Innovation Portfolios

The portfolio is analyzed over five dimensions: return, capability, time to market, risk of technical/regulatory failure, and sunk costs. These five dimensions and their levels (low/high, the five distributions, ...) were chosen based on an extensive review of the innovation literature, as well as intensive phone interviews with top executives of eight agribusiness companies in different sub-industries and of different size. The return dimension is expressed with a distribution relative to the hurdle rate (=desired rate of return on R&D projects set by the company.) To the knowledge of the researcher, this study is one of the rare ones, if not the only ones, that provides such quantitative findings on innovation portfolio characteristics.

On average, companies in the food and agricultural sector have a diversified portfolio with regards to return, with some bias toward high returns, low-risk of technical/regulatory failure, and in-house projects. An analysis by company and industry characteristics shows that smaller firms are more biased against risky projects; they have more short-term projects and fewer technically risky projects. The results did not show a higher likelihood for firms committed to innovation to have more diversified portfolios over any of the five dimensions. The use of several selection methods, several functional areas, specific functional areas, and specific selection methods does not have much effect on innovation portfolios. Companies involving the sales department in the selection process are likely to have more short-term projects and fewer technically risky projects.

Conclusion

Given the critical need to invest in innovation for the survival of companies, it is with no surprise that most companies report being committed to innovation. But, developing an efficient selection process is no small task for companies. This paper shows strong evidence that the innovation theory is not applied to its fullest in the food and agribusiness sector. The fact that there is extensive literature on cross-functional teams, selection methods, and portfolio diversification suggests that either companies need more training on the theories or the theories are not adapted to the real world. Future research should therefore focus on determining the difficulties companies are facing when trying to apply the theory and when the theory is failing. This research provides a significant contribution to the literature through the portfolio characteristic, showing that food and agribusiness companies have diversified portfolios at least over some dimensions. The characteristics of the portfolio, as well as the practices in terms of functional areas and selection methods, do vary with company and industry characteristics.