

A roadmap for optimal decision making with causal models

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Causal models are very useful in business, financial, and economic applications because they support the process of decision making. Causal models implement a manipulability notion of causation. That is, they study if and how changing the value of a variable affects other variables.

In firms, banks, government agencies people in management positions make decisions to steer their organization towards given goals. They can intervene on some variables to obtain desired changes in other variables. They might increase the sales force hoping to increase sales, they might invest in R&D to improve innovation, or they might make capital investments to optimize productions. Causal models are the ideal tool to support this type of decisions.

Here are a few practical considerations for the implementation of these models.

1. Implementing and using causal models is an adaptive iterative process
2. The first step is defining the descriptive framework, that is, the variables that will describe the activity
3. Many variables will be ill defined, either because it is impossible to aggregate heterogeneous rapidly evolving elements and because some variables are obtained with intrinsically uncertain methods such as questionnaires
4. Variables must form a model, a theory. The relationships between variables are critical
5. After creating the descriptive framework, the first model should be created
6. In the causal discovery process management experience is a necessary input to the algorithm
7. The newly created model should be considered very critically
8. Simulation of different interventions should be considered; management should form an idea of how the firm responds to changes
9. The iterative revision process should begin adding or changing variables
10. New models should be created; models and variables must change together
11. Causal models are a simulation tools. Management must focus on the critical points of intervention
12. Management must make sure to avoid unattainable or false objectives
13. Management must have a clear understanding of the causal model
14. A causal model is an image of a firm
15. The decision-making process should understand the change of image implied by interventions

In summary, causal models are powerful tools, very helpful as support of the decision-making process. They are not black boxes. Causal models offer a precise picture of the chain of command of an organization.