

Estimating Cost of CSR Strategy

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Abstract - *Corporations engage in Corporate Social Responsibility (CSR) activities for diverse objectives. An important question is how corporations create business value of the CSR activities. To address this question, corporations should consider developing a CSR strategy. Corporations need to measure the cost and benefits of the CSR activities and their returns on investment. One challenge is to estimate the cost of various strategic options while developing the CSR strategy. Cost estimation of the CSR strategy is challenging due to inherent uncertainties and many dynamics involved. The objective of this paper is to examine relevant dynamics in estimating the total cost of executing the CSR strategy over a period and develop a generic model that can be used to estimate the costs under various conditions and scenarios.*

Keywords: Corporate Social Responsibility strategy, cost of CSR strategy, estimating cost of CSR strategy

1 Introduction

Corporations engage in various CSR activities to fulfill diverse economic, legal, ethical and philanthropic responsibilities [20]. An important question is how corporations create business value of the CSR activities. To address this question, corporations should consider developing a CSR strategy. Otherwise, there is potentially huge cost of not having a CSR strategy.

CSR activities result in additional costs. CSR activities such as employee welfare programs, donating for charity, sponsoring community development programs, and establishing environmental friendly operations and policies all cost some money and corporations have to make budget for them. On the other hand, CSR activities may provide financial and non-financial benefits in the form of enhancing shareholder value by increased sales, increasing customer loyalty, reducing the waste, improving the corporation reputation, improving employee morale and productivity, and stimulating innovation [1][2][3].

An important question is how the corporations create business value by performing CSR activities? To address this question, corporations should consider developing a CSR strategy. Otherwise, there is potentially huge cost of not having a CSR strategy [1][2][3][4][5][6]. Corporations need to measure the cost and benefits of the CSR activities and their returns on investment. If the costs are higher than the benefits, the corporation may not sustain its CSR strategy.

One challenge is to estimate the cost of various strategic options while developing the CSR strategy. Cost estimation of the CSR strategy is challenging due to inherent uncertainties and many dynamics involved [4][5][6].

In our earlier work, we introduced an intelligence framework and used it for analyzing complex decision problems in service delivery and cost estimation. We applied this framework to analyze delivery of digital services with network effects over hybrid clouds and we developed models for estimating the cost of digital service delivery over clouds [10][11][13]. We additionally applied this framework for evaluating the smart community wireless platforms [14][15][16][17], and evaluating enterprise mobility strategy and for estimating its cost [18][19]. In our related work at [20], we studied how to model and evaluate CSR strategy and proposed a model for the CSR strategy that utilized the same objective. The objective of this paper is to examine several relevant dynamics in estimating the total cost of executing the CSR strategy over a period and develop a generic model that can be used to estimate the costs under various conditions and scenarios. This work is an extension of [20] and uses the same intelligence framework.

2 Developing Model for Cost Estimation of CSR Strategy

Various approaches may be employed for estimating the cost of CSR activities. For example, a resource-based-view (RBV) based approach has been proposed for corporations to determine its optimal level of investment in CSR [4].

One challenge with estimating the cost of CSR strategy is that it requires understanding the dynamics at the macro-environment level, industry level, competitors and global value chain level and organization level. Even when considering the organization only, CSR strategy, as we argued in [20], has components at the corporate, business and functional levels. We believe a layered intelligence framework is more suitable for such a challenging estimation. Different layers of the intelligence framework should provide decision making help for business level objectives, strategy and policy level objectives, and for functional objectives.

Additionally, the intelligence framework should support qualitative analysis as there may not be enough data to build quantitative data analysis models or to find some patterns for success. This is an example to a true uncertainty situation where qualitative analysis with hypothesis are helpful.

Qualitative analysis can reveal opportunities for estimation where enough data does not exist yet. Early research is important toward understanding the problem. The corporation should develop hypothesis and improve them with more and detailed research. Our suggested methodology for this estimation problem is:

1. State the beliefs
2. Restate the beliefs as hypothesis
3. Design experiments and models to test hypothesis
4. Observe results
5. Reflect on what results mean, do sensitivity analysis and compare results, and reflect on what to do next
6. Iterate as more research is done, reflect and improve on the hypothesis

Our suggestions for corporations is to develop the hypothesis as teams (e.g. executive team) so that the teams are accountable for the initial hypothesis and for improving it.

In this section, we will introduce our intelligence framework that we use for estimating the cost of CSR strategy.

In our intelligence framework, estimation is done by building system dynamic models together with economical, statistical and machine learning models, and running simulations, performing sensitivity analysis. System dynamics modeling in general is used for understanding and analyzing business and management related issues such as estimating cost, benefits and return on investment, and risk analysis. To estimate the cost of the CSR strategy over a period, simulation is a powerful tool to try different scenarios.

SD model acts as the high level model addressing the needs of business, strategy and policy analysis objectives. Economical, statistical and machine learning models are developed at lower layers of the intelligence framework and integrated with the SD model to support decision making. Qualitative system dynamics approach improves system understanding and prediction for various scenarios, even in the absence of quantitative data.

When detailed statistical analysis could not be done due to shortage of data and exact understanding of how the system works, system dynamics models involving hypothesized assumptions can be valuable tools to demonstrate expected impact of various business decisions involving feedback relationships. With SD model, one can model the network effects among different sides on the platform and model how the economical utilities due to network effects behave. In our framework, estimation is done by building system dynamic (SD) models together with economical, statistical and machine learning models, and running simulations, performing sensitivity analysis. Qualitative system dynamics approach improves system understanding and prediction for various scenarios, even in the absence of quantitative data. This framework has been used in [10][11][12][13][14][15][16][17][18][19].

In this paper, we focus on developing a system dynamics model for estimating the cost of the CSR strategy. We will

present our SD model in Models for Cost Estimation section. Although not the subject of this paper, we would like to summarize our overall approach for estimating the cost by using the intelligence framework. For this problem, we use economical, statistical and machine learning models as follows:

- Use economical models for calculating various cost and revenue components.
- Use statistical methods in tests to see significant difference between different platforms and between different scenarios.
- Use statistical hypothesis testing to test relations among different dynamics related to the platform.
- Use machine learning methods to analyze collected data per CSR activity for predicting future use and demand forecasting, finding out significant parameters, association rules regarding the success of the platforms.

We believe statistical, economic and machine learning models and methods are not sufficient by themselves to analyze complex platforms such as this one, and SD is most suitable to be used together with these methods, hence a more powerful intelligence framework for better analysis and understanding can be constructed. SD is powerful for modeling the positive and negative feedback loops among cost related dynamics.

This paper is more related to identifying the dynamics in estimating the cost of CSR strategy. The cost related dynamics depend on the characteristics of the CSR strategy. The characterization of the CSR strategy has been addressed in our work in [20]. Such characterization of the CSR strategy is a step needed in estimating the cost. Once the CSR strategy is characterized as in [20], cost related dynamics can be characterized and models for estimating the cost of CSR strategy could be developed. For the scope of this paper, we follow the following methodology for characterizing the cost dynamics and for building models to estimate the cost of CSR strategy.

1. Work out the characteristics of cost related dynamics which will be needed in simulation and decision making.
2. Once conceptual dynamics are characterized and cost related variables in those dynamics are identified, these dynamics are incorporated into SD models for estimating the cost.
3. With data collected during planning, development and operational phases of the CSR strategy, build and fine tune the statistical, economical and machine learning models, integrate them with SD model, validate and fine tune the SD model.

In the rest of this paper, we will apply the first two steps above.

3 Cost Components of CSR Strategy

In the subsequent sections, we will outline characteristics of cost related dynamics in the CSR strategy. We will outline costs of performing CSR activities which will consume resources such as cash or employee time as well as opportunity costs of engaging and not engaging in certain CSR activities.

3.1 Cost of Strategy Development

This cost component includes:

- The cost of identifying relevant social and environmental issues and related stakeholders
- The cost for building a baseline for the state of CSR in the corporation via a CSR assessment and risk analysis to assist leadership in identifying CSR priorities and goals
- The cost for building a social license
- The cost for devising the CSR strategy, modeling and evaluating it within the corporation [20]
- The cost for consulting with management consulting firms for developing the CSR strategy
- The cost for researching to understand what customers, distributors and suppliers think about CSR by external reviews, surveys, market analysis, research reports, consultancy firms recommendations.

These are usually cost of hours spent on these tasks by the executives of the corporation, which they could spend on other things otherwise. There is cost with holding discussions with major stakeholders, creating working groups to prepare draft models, consulting with affected stakeholders, reviewing and revising the strategy.

3.2 Cost of Alignment with CSR Strategy

This is the cost of self-assessing the corporation's current CSR performance, explaining the CSR strategy to stakeholders, publishing the CSR commitments, getting the buy-ins of stakeholders and internal alignment of corporation business units with the CSR strategy. There is also cost of ensuring employee buy-in by including and encouraging employees in participating the process of developing the CSR strategy and executing it [4].

3.3 Cost of CSR Activities

With CSR, corporations have to pay for the committed activities such as for environmental programs and more employee training.

General cost components include:

- Cash Expenses: The corporation may choose monetary donation to charities with no expected publicity, such as if the corporation has allocated some donation money in the budget. Then it is a cost for the corporation in the budget. The costs associated with

cash contributions include the raw cash flows less the reduction in taxes [4].

- Product Expenses: The corporation may choose to donate products. In this case, the total cost would equal product cost (materials + labor + overhead) less any tax benefits [4].
- Employee Time Expenses: The corporation may choose to allow employee volunteering time. When employees volunteer their time, there is cost associated with reductions in productivity [4].
- Hiring Expenses: The corporation may need to hire additional personnel to cover for the lost time and productivity due to volunteering. This is a cost for the corporation. Additionally, the corporation may hire employee(s) dedicated to performing CSR related efforts such as coordinating CSR activities, putting press releases and lengthy reports together [4]. Then, there will be costs of new employees to the corporation.

Depending on the type of CSR activities, the corporation incurs costs of doing those activities. There are many different CSR activities the corporations may engage in. We provide few examples below:

- Cost of Environmental Activities: This is the cost associated with CSR environmental activities. For example, the cost of making products using recycled raw materials as opposed to using new raw materials. This may be costly. On the other hand, the costs of environmentally-friendly approaches may be lower than those of traditional approaches. In that case, the result is a financial benefit rather than cost [4].
- Cost of Employee Training: One cost of employee training is for providing training to the employees who participate in CSR activities. In general, the corporation may choose to provide training to increase employee welfare and satisfaction. This would result in costs to the corporation.
- Cost of Product Transformations: The corporation may engage in CSR activity that requires product transformations such as producing more sophisticated and responsible product. There will be associated cost for this such as reorganizing the production system and investing into more responsible technologies for production [4].

3.4 Cost of Operations

This is the cost of making sure the CSR activities are performed, they are monitored and accounted for. This cost is mainly the cost of time of the employees involved in conducting the CSR activities and investments into the corporate systems for conducting and monitoring those activities (e.g. cost of software and infrastructure for data collection).

- Cost of Monitoring and Evaluation: This is the cost of monitoring the progress on the CSR strategy and

periodically evaluating its success. Key Performance Indicators corresponding to the CSR goals are defined and are monitored through the execution of the CSR strategy. KPI and evaluations can be generated and monitored at different levels at the corporate, business unit or department, project and individual levels. The top CSR goals are to be included in the company's business plans. They are to be planned, achieved, monitored and evaluated throughout the year in policies, practices and in the corporate culture.

- **Cost of Reporting:** Corporations produce annual reports that cover their CSR status and accomplishments. The information in the reports are usually integrated in the participant's main medium of stakeholder communications, for example a corporate responsibility or sustainability report and/or an integrated financial and sustainability report. An integrated report includes environmental, social and economic performance alongside financial performance information and is expected to provide users with a more holistic overview of a company [4]. This effort costs the corporation as it takes time and could involve hiring extra personnel to manage all the CSR reporting. Additionally, these reports are externally audited, which is another cost.
- **Cost of Auditing:** Corporations may do a CSR internal audit as a way of assessing the performance of CSR activities, and observing the compliance with policies, procedures, and practices. One other purpose with the internal audit is to seek opportunities for improvement in tools and operational procedures. This is the cost of conducting an internal CSR audit.
- **Cost of Third-Party Validation:** Monitoring and evaluation may also be conducted by an independent third party, which will cost to the corporation.
- **Cost of Organizational Changes and Procedures:** This is the cost of process improvements to better suit the CSR objectives. For example, CSR becomes a core component in compensation packages, incentives and rewards to all executives, managers and employees. The internal process improvements may affect most or all business units, which will add cost to the corporation.

3.5 Cost of CSR Management System and Analytics

The corporation may build a management system for managing the CSR activities. The system would initially have a data store for all the CSR related records and a BI (business intelligence) dashboards for visualizing and monitoring the progress. The system could evolve into a more automated data-driven CSR management system with predictive analytics, environmental management system (EMS) and may use IoT sub-systems that capture all the measurable metrics and save them into data stores for analytics. There is cost for building a system for collecting KPI data, visualizing, monitoring and performing analytics. The corporation may need to define an analytics roadmap for

all CSR related data and there is cost associated with defining one and implementing a system for it.

3.6 Cost of Participating in Global Value Chains

[7] addresses CSR issues when the corporation is participating in a global value chain (GVC). As [7] states, participating in a GVC takes into account the managerial situations where introducing CSR policies involves not just the corporation itself but a larger collection of other corporations involved in GVCs. "In this context, implementing CSR policies implies various forms of cooperation and coordination with a large collection of participants, suppliers, contractors, distributors, clients, strategic allies and stakeholders" where the challenge becomes "how a collection of legally independent business organisations located in different parts of the world can collectively implement and give value to a series of scattered socially responsible practices" [7].

As [7] argues, "implementing CSR policies in GVCs involves many changes and transformations, which inevitably generate costs." The authors explain three types of costs: (i) organizational costs; (ii) transaction costs with business partners and (iii) cooperation costs with secondary stakeholders. In this section, we will outline how these cost components can be characterized and can be incorporated into the cost model we will present in Models for Cost Estimation section.

1. **Organizational Costs:** [7] describes four major cost components: "product transformations (moving into more sophisticated and responsible product lines); productive process improvements (reorganising the production system and introducing more responsible technologies); creation or abandonment of certain functions (increasing the skills and competences of chain members) and chain upgrading (changing the overall pattern of activities and institutions of the industry)". We included the first two in the previous sections when we consider the CSR strategy of a corporation alone. The last two occur when the corporation participates in GVC. Even for the first two cost components, the cost figures for them could increase due to network effects that exist in the GVC platform. We address such network effects in in Models for Cost Estimation section.
2. **Transaction Costs:** Developing and implementing CSR strategy in GVCs generates transaction costs. For example, implementing CSR policies may require severing existing contracts, switching to new suppliers and introducing new actors along the GVC such as certification bodies, auditors, partners for developing new technologies, new suppliers or distributors [7]. Incorporating these new actors generates transaction costs. For this kind of cost, network effects should also be taken into account as they may influence the transaction cost components.
3. **Cooperation Costs:** The implementation of CSR strategy in GVCs requires coordination with

secondary and non-business stakeholders. These stakeholders may include diverse actors operating at various levels and include international organizations, national governments, NGOs, trade unions, advocacy groups, local business associations, community organizations and religious groups [7]. Chain members must develop horizontal forms of collaboration with such stakeholders. Network effects exist in the GVC platform and those network effects have influence on the cooperation cost components.

3.7 Opportunity Costs

Opportunity costs may exist when the corporation engages and also when it does not engage in CSR activities. In either the case, there could be opportunity cost. Two types of opportunity costs could be included in the overall cost estimation exercise:

1. **Opportunity Costs with Performing CSR Activities:**
This is the cost of activities the corporation was unable to undertake due to engaging in CSR activities. For example, if the corporation chooses to do cash or product/service donations, then an opportunity cost could be investing the amount of money for a new product/service that will bring in some profit to the corporation. Similarly, when the corporation chooses to allow employee volunteering, there is opportunity cost due to employee time not being utilized for increasing the corporation's profits [4]. Measuring the opportunity cost is more difficult when there is no clear input-output relation and when network effects exist.
2. **Opportunity Costs with Not Performing CSR Activities:** Corporations not engaging in certain CSR activities might be missing some benefits they would get otherwise. Also, they might be subject to costly risks (e.g. fines) for not performing.

4 Models for Cost Estimation

Once the characterization of the cost components is complete, the methodology suggests following the intelligence framework we summarized in Developing Model for Cost Estimation of CSR Strategy section for building models. In this section, we develop SD models taking into consideration the cost related dynamics and variables we outlined in Cost Components of CSR Strategy section.

The initial cost model would be a linear model that can be developed using a spreadsheet tool, and as such is not of big interest for our research.

The ongoing cost model considers the cost components which have more dynamic relations among them as well as benefits of the CSR strategy and various external dynamics. This ongoing cost model would have feedback loops and non-linear relations where the advantages of systems dynamics modeling can be realized compared to the initial cost model. SD is appropriate for the estimation of ongoing cost for the following reasons:

- **Non-linear relationships and feedback loops:** Many non-linear relationships among different cost components could be identified. Positive and negative feedback loops exist among different dynamics. Such feedback loops are more visible when the corporation participates in GVCs where the corporation faces cooperation costs by working and cooperating with secondary stakeholders and these costs have feedback loops with other cost related dynamics depending on the level and success of the cooperation with various kinds of secondary stakeholders.
- **Network effects:** Same side network externalities exist among various cost related dynamics. Cross side network externalities also exist especially when the corporation participates in GVC. When the corporation participated in GVC, controlling and predicting behaviors of stakeholders becomes more difficult as the plurality, heterogeneity and objectives of the stakeholders vary. In such as environment, the cost of CSR activities and the cost a corporation would like to invest would depend on many external dynamics including industrial, social political ones. [7] states this dynamism as "Implementing a strategic CSR policy does not constitute a simple trade-off between the costs and benefits of such policy; it engages many different actors and stakeholders located in different institutional contexts who must find and implement new coordination patterns".
- **Intangible and qualitative cost components:** Many cost components are hard to quantify and require qualitative inputs into the model. SD is powerful for abstracting qualitative inputs into the model.
- **The cost depends on characterization of corporation and CSR activities:** SD is powerful for such characterizations as we argued in [20].
- **The cost depends on the benefits of the CSR strategy:** If the sought benefits are realized over time, the corporation would continue spending on the CSR activities. As we argued in [21], SD is powerful for measuring the benefits of CSR strategy.

Figure 1 shows the generic SD model for estimating the ongoing cost. The observed benefits of the CSR activities depend on the observed value of the CSR activities and the rate the observed value diminishes. The last two also influence the GVC participation characteristics of the corporation, such as the level of corporations commitment into GVC and its influence on the GVC members on the CSR related issues, and the CSR activities characteristics that the corporation would engage in. The GVC participation characteristics and the CSR activities characteristics influence the various cost components.

The cost that the corporation has budgeted to spend depends on the expected cost and the observed benefits. That budget has influence on the quality and the impact of the CSR activities. Cost will increase as the corporations see the

benefits – up to a certain limit. There should be positive loop that will cause the increase, and a corresponding negative balancing loop. The equilibrium should be reached when the observed value stabilizes. As the observed value changes, positive and negative loops will bring the expected cost to its new levels.

One advantage with SD analysis is to be able to simulate the uncertainties and compare the costs under different scenarios

through sensitivity analysis. Another challenge with measuring costs is that some costs are realized over a long-term. Different statistical distributions may be used to take effect over time for the characterizations, and that way, their impacts on the costs are measured over a long term. Triggers for various dynamics at certain times help with analyzing the impacts over a long-term.

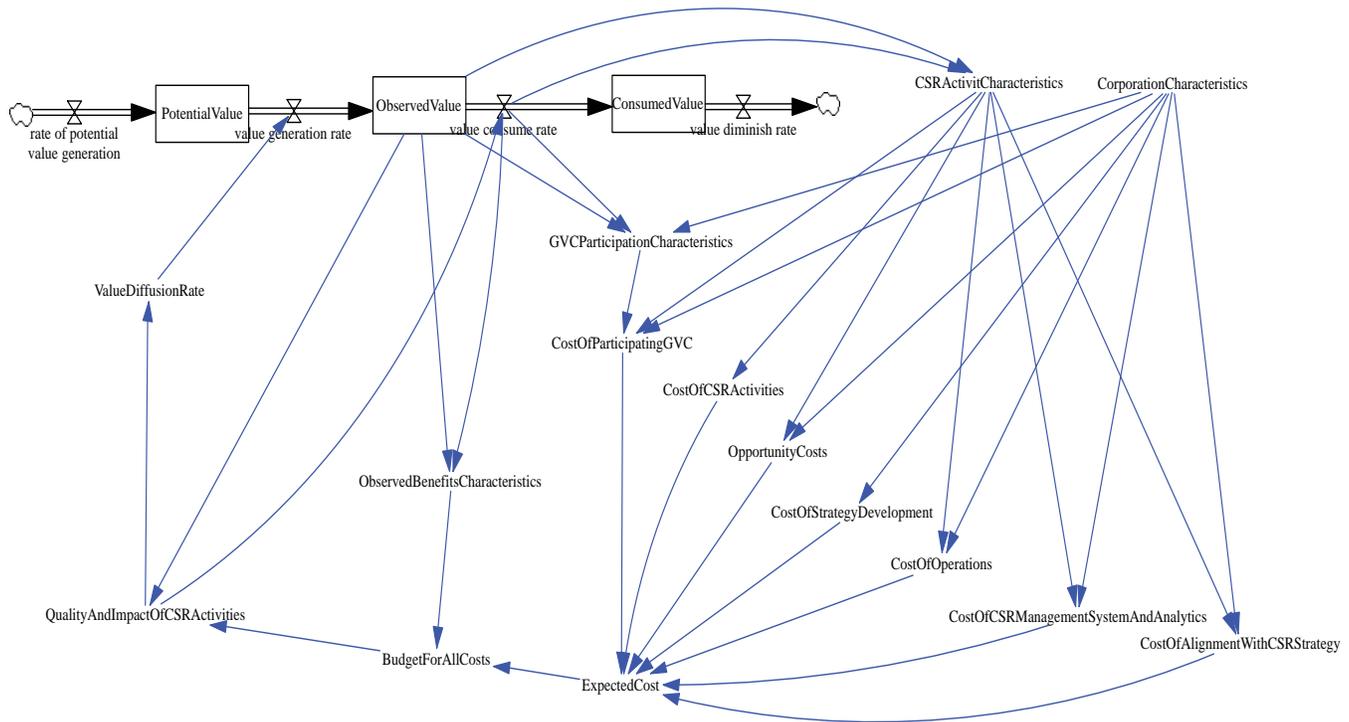


Figure 1 Generic SD Model for Estimating Ongoing Cost of CSR Strategy

The model contains all different characteristics and their relationships in an abstract and conceptual manner. When the model is instantiated for a specific CSR strategy, only the relevant variables are populated for each characteristic. Otherwise, a model that contains most variables is hard to build, nor would be helpful because of huge diversity in cost components. An instantiated model is used for estimating the costs in existence of network externalities for a CSR strategy. When enough data is not available, system dynamics modeling and simulation is still helpful by incorporating the initial hypothesis into the model, and by performing sensitivity analysis based on assumptions, expert opinions, estimations and observations for providing insights to many managerial questions.

5 Conclusions

Corporations engage in Corporate Social Responsibility (CSR) activities for diverse objectives. An important question is how corporations create business value of the CSR activities. To address this question, corporations should consider developing a CSR strategy. Corporations need to measure the cost and benefits of the CSR activities and their

returns on investment. One challenge is to estimate the cost of various strategic options while developing the CSR strategy. Cost estimation of the CSR strategy is challenging due to inherent uncertainties and many dynamics involved. We believe a layered intelligence framework is suitable for such a challenging estimation. Different layers of the intelligence framework should provide decision making help for business level objectives, strategy and policy level objectives, and for functional objectives. Additionally, the intelligence framework should support qualitative analysis.

The objective of this paper is to examine relevant dynamics in estimating the total cost of executing the CSR strategy over a period and develop a generic model that can be used to estimate the costs under various conditions and scenarios.

Considerations on the total cost of executing the CSR strategy should be given and some questions like the following should be brought up during strategy development phase:

- How much value is generated by engaging in CSR activities and how that value changes over time.
 - Similarly how much for the consumed value that no longer benefits the corporation

- How the costs invested into various dynamics impact the quality and impact of the CSR activities
- How the characteristics of the CSR activities influence the different cost components over time
- How the various characterizations of corporations GVC participation impact the cost and the observed value of the CSR activities

This paper develops a generic model that can be used to answer these questions. This paper identifies a set of cost components involved in developing a CSR strategy. It sets forth a methodology for characterizing various cost dynamics the corporations should consider while developing the strategy. The paper outlines how the different options in the CSR strategy impact these cost components. Based on analysis of dynamics involved in cost estimation, a generic SD model is developed. Running the model and comparing results of instantiations of the model for various options is our future work.

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