Value Exchange and Formation of Coalitions

Pavel Hruby
phruby@acm.org

Abstract. The purpose of this short paper is to trigger discussion[1] on possible alternative application of the REA model to the area of organizational theory. This paper presents a brief analysis of mechanics of coalition organizational structures and illustrates similarities with the exchange process described by the REA model.

1   Introduction

The REA (Resources, Event, Agents) was originally developed by McCarthy (1982) as a generalized accounting model. Since approximately 1995, has been evolved by McCarthy and Guido Geerts into an ontology for economic systems (Geerts and McCarthy 2000a, 2000b, 2002). One of the main features of the REA ontology is the concept of duality, which is a relationship binding incremental and decremental economic events together, thus forming a value-adding process. The REA models in the independent view allow for modeling networks of independent business entities.

Coalition is a social system usually described as a temporary alliance, especially of political parties or fractions, but they are also common in governmental agencies, universities and in larger firms (Yi 2003). Behavioral theory of the firm suggests that probably in any larger organization coalitions of individuals or groups exist, participating in making decisions and in setting own, mutually inconsistent goals (Cyert and March 1963).

Although the definition of coalition as a "group of members that agree to work together in a partnership to achieve a common goal" (Wikipedia) is not incorrect; the word *coalesce* connotes a "coming together to achieve a goal" (Merriam-Webster), perhaps a better way is to characterize a coalition as a *group of decision-makers with parochial (individual, specific, narrow) interests, where collective decisions are reached by negotiations, using exchanges of resources with other coalition members*. The main characteristics of coalitions that differentiates them from other social structures are internal inconsistencies, where all members (though in various degree) struggle to influence the coalition decision to their favor (Cyert and March 1963).

While the REA model is considered to be applicable to economic systems, to trade (the exchange process) and to production (the conversion process), this paper explores whether, and to what extent, the REA and similar ontologies are applicable to the process of coalition formation. We use the REA model as an example of a value-modeling ontology; using e3-value (Gordijn, Akkermans 2001, 2003), VDML (2015) or other method could be an interesting extension. In the rest of this paper we

---

[1] A note for the reviewers: This paper is a collection of preliminary thoughts on applicability of REA and possibly e3-value and other value models, to organizational theory. The author wishes feedback, and suggestions regarding theoretical or practical potential of this idea.

describe coalition characteristics, the exchange process from the perspective of the coalition theory, strategies to win an exchange, lobbyism and internal structure of a coalition. For each of the sections we illustrate a sketch or suggestion how a corresponding REA model could be constructed.

2   Characteristics of a Coalition

The following four characteristics help understand the nature of coalitions and how the exchange process sustains them (McFarland and Gomez, 2013).

- Coalitions are groups of participants with different preferences and parochial (specific, narrow) interests that do not always align. The decisions in a coalition require bargaining and are made within a context of potential conflict.
- The objective of all participants is to form a coalition capable of making decisions favorable to *them*.
- Due to parochial interests of each participant and because of internal inconsistencies within the coalition, the decision process is characterized by power struggle and conflicts between participants. To influence the coalition decision in their favor, the participants have to make deals, agreements and exchanges of resources.
- Resources obtained through a coordinated coalition action (they could range from strategic incentives, information, to symbolic benefits) are distributed to the competing coalition members. This is what members get in return for joining a coalition.

Each participant in a coalition has control over certain resources (things that others want). The final coalition decision or action is the result of bargaining and the exchange processes among the participants.

3   The Coalition Exchange Process

The exchange process is the generative process of the coalition formation.

The exchange process encompasses the following four steps (McFarland and Gomez, 2013).
- Every participant enters a voluntary exchange of resources (tradeables) with other participants, regulated by rules.
- Participants bring resources to the negotiation table. A resource is anything of value to other participants, for example, money, expertise, information, skills and knowledge, access to external actors like regulative agencies, and rights and ability to perform some action.
- The mutually acceptable trades are arranged, according to the rules.
- Each participant trades the resources, trying to improve their position, fulfilling their preferences and interests, until no more mutually acceptable trades are possible, or until the time limit elapses (some negotiations do not have a time limit, but some have deadlines).

The REA exchange process seems to be identical to the exchange process forming a coalition. In both cases, each resource that is subject to exchange has a different value for the agents participating in the exchange. For rational economic agents, an exchange can occur only if both economic agents perceive the value of the received economic resources higher than the value of the given resources; otherwise, they will not exchange them. The REA model (in the independent view) for a coalition exchange is illustrated in Fig. 1.
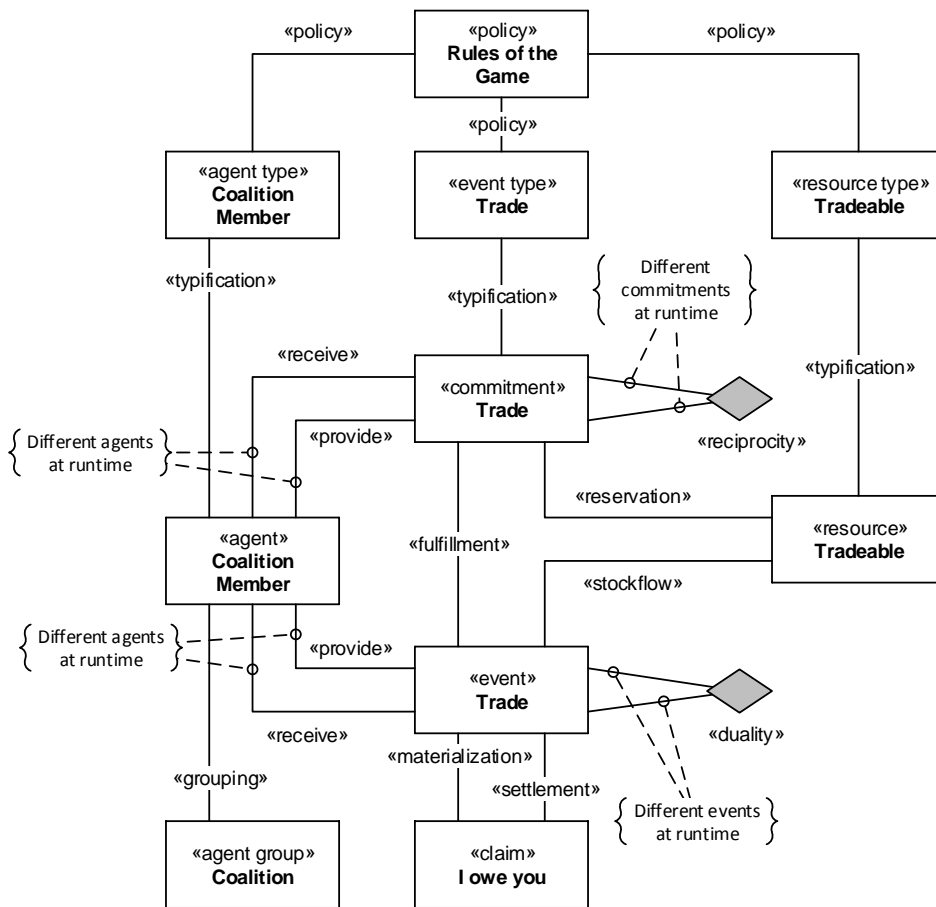

Fig. 1. REA model of coalition exchange

4   Strategies to Win an Exchange

Coalition members can use various strategies to increase their position in the exchange processes (McFarland and Gomez, 2013):
• The ability to control the rules. This is probably the most powerful way a member can increase its position. For example, is a coalition member, such a specific employee at a university or research institution, able to influence the rules for allocating research grants?

- Control over the resources. A participant can increase its position if it has resources others need and want. Control over the resources creates a power-dependence relation or a leverage over other participants. It can go both ways, if someone else controls a resource a participant wants, they have a leverage over that participant, forcing him to exchange far more of its own resources for the resources it desperately needs.
- Control over preferences of other participants. A participant can influence the preferences of other participants and change what others want – in this way a participant can create demand for the own resources and made his resources more valuable in the perception of other participants.

The first strategy, the ability to control the rules, is related to REA concept of policy (Geerts and McCarthy 2006). While we can easily create an REA model of a process that changes a policy controlling another exchange process, it is harder to illustrate in the REA model the value relationship or cause-and-effect relationship between the policy-changing process and the corresponding exchange process. The second strategy, control over the resources, is the primary ability of economic agent in the REA model, so REA can model this this strategy easily and fully. The third strategy, create demand for participant's own resources, is not directly covered by REA, although several attempts exist (ref to be added), because similar processes are known from business practice. Processes such as marketing campaigns, advertisements and commercials have the same effect – they increase buyers' perception of value of offered goods and services. The POA concept of business case (Scheller, Hruby, 2016) can explicitly model expectations for performing an action.

5   Lobbyism and Coalition Management

As bargaining is the essential mechanism of coalition mechanics, the ambiguity and lack of clarity of expected output is (paradoxically) necessary for existence of a coalition. When issues get cleared up or resolved, members tend to leave a coalition.

Lobbyists are coalition brokers that manage the exchanges so that members can effectively accomplish their interests. The lobbyists need to think about a series of exchanges with unpredictable results involving variety of resources. Common techniques used by lobbyists to manage the exchanges are horse-trading, bribing, persuasion, making threats, providing or refusing access to information, log rolling, forming alliances, and joining associations (McFarland and Gomez, 2013).

An interesting consequence on the coalition lifecycle is that coalitions often start strong, get weaker over time, and finally fall apart. A possible explanation is that when lobbyists are trying to bargain for a coalition, it is often necessary to over-estimate benefits of the results. Likewise, members often exaggerate their support This often leads to disappointment later and danger of dissolution of the collation. Building coalitions requires constant bargaining and maintaining them requires ambiguity.

As lobbyists are facilitators of the exchanges between coalition members, lobbyism probably out of scope of the REA model; REA abstracts from the execution engine of the exchanges. However, in order to explain the coalition lifecycle, we should

probably have some way of registering the perceived value of the resources, which is, for the time being, out of scope of the REA model.

6   Internal Structure of a Coalition

There are three main types of coalition members: core members, players and tag-alongs. They vary in their commitment, in the resources they provide and in their expectations what they get in return.

- The core members (founders) bring to the coalition a high level of commitment, time, money, reputation and expertise. Their goal is an overall strategic victory in the collective decision and coalition organizational action.
- The players (specialists) care about specific issues. The usually bring enough resources to get a seat at the negotiating table, often it is their expertise on a specific issue. As long as their specific issue is at stake, they stay on with the coalition.
- The tag-along members have least interest and their goal is to acquire coalition byproducts. They bring only few resources, for example, they let others to use their name, and expect very little in return.

McFarland and Gomez (2013) summarized it as: "The core members are interested in getting the bill passed; the players wanted a paragraph; and the tag-alongs wanted a picture for their newsletter."

The coalition itself in the REA model can be expressed as a Group, see Fig. 1. Groups are REA entities that represent heterogeneous collections, can contain statistical properties about their members; for example, number of coalition participants, etc. Due to the dynamic nature of the types of coalition members, a player might over time become a core member, loose interest and become a tag-along and vice versa, probably the best way to model types of coalition members is by using the REA concept of Group, or Classification Pattern (Hruby et al, 2006).

7   Conclusions and Other Thoughts

The exchange process is not only a process we can observe in economy, but is also a process explaining creating coalitions as social structures. An attempt to apply the REA exchange process to the coalition formation raises questions; some of them are listed below.

Should we extend the concept of economic resource in the REA ontology? In coalition theory, the resource is anything that is scarce and other coalition members want: expertise, information, skills, access to others, ability to perform certain action. For example, a vote for (or against) a legislative proposal is a resource – it can be traded for another resource and is part of negotiations. Should we consider "a vote for a legislative proposal" and economic resource as REA ontology defines it?

The negotiation process (the constant bargaining) is an important aspect of coalition dynamics. However, to what extend it is covered by the REA model is a question. The ISO/IEC 15944-4 (2006), which is based on REA, specifies a business transaction phase called "Negotiation", however, commitment in the REA ontology is

a promise by a trading partner to initiate an economic event in the future. How to model negotiation scenarios like "If I would do this, would you do that?", is a question. In REA we can certainly model the results of a negotiation (the actual commitments), but how to model the proposed commitments is not clear.

While the REA model describes very well the concept of control over the resources by economic agents, it is less clear how to model the two other aspects of coalition power struggle – ability to change the rules during the game, and ability to increase demand of own resources. This could be a topic for a future research.

8   References

Cyert, R., March, J. (1963) A Behavioral Theory of the Firm, Prentice-Hall,

Geerts, G., L., and McCarthy, W., E. (2000a). The Ontological Foundations of REA Enterprise Information Systems. Annual Meeting of the American Accounting Association, Philadelphia, PA. https://msu.edu/user/mccarth4/Alabama.doc

Geerts, G., L., and McCarthy, W., E. 2000b. The Ontological Foundations of REA Enterprise Information Systems. Annual Meeting of the American Accounting Association, Philadelphia, PA.

Geerts, G., L., and McCarthy, W., E. 2002 An Ontological Analysis of the Primitives of the Extended REA Enterprise Information Architecture. *The International Journal of Accounting Information Systems*, (March): 1-16

Geerts, G., L., and McCarthy, W., E. 2006. Policy Level Specifications in REA Enterprise Information Systems,. The Journal of Information Systems 5 (4): 37 - 63.

Gordijn, J, H. and Akkermans. H. (2001). E3-value: Design and Evaluation of e-Business Models. In *IEEE Intelligent Systems,* Vol. 16(4): 11-17

Gordijn J., Akkermans H. (2003) Exploring Innovative e-Commerce Ideas, Centre for e-Business Research, Vrije Universiteit, The Netherlands

Hruby, P., and Kiehn, J., and Scheller, C., V. (2006). Model-Driven Design Using Business Patterns. Springer

ISO/IEC 15944-4:2006 Information technology - Business agreement semantic descriptive techniques -- Part 4: Open-edi business transaction ontology,

McCarthy W., Geerts, G., Gal, G. (2016) Congruent and Meronymic Constellations in the REA Ontology, VMBO 2016, http://www.loa.istc.cnr.it/vmbo2016/wp-content/uploads/2016/02/VMBO2016_paper_15.pdf

McFarland, D., Gomez, C. (2013) Organizational Analysis, Stanford University

Merriam-Webster Dictionary, Definition of Coalition, https://www.merriam-webster.com/dictionary/coalition

Scheller C.V., Hruby, P. (2016) Business Process and Value Delivery Modeling Using Possession, Ownership, and Availability (POA) in Enterprises and Business Networks. Journal of Information Systems: Summer 2016, Vol. 30, No. 2, pp. 5-47.

Yi, S.: Endogenous formation of economic coalitions: in Carlo, Carraro (2003): The Endogenous Formation of economic coalitions. Northhampton Massachusetts: Edward Elgar Publishing Limited, available here.

VDML (2015), Value Delivery Modeling Language, OMG: http://www.omg.org/spec/VDML/

Wikipedia: Coalition, https://en.wikipedia.org/wiki/Coalition