

THE CORE CONCEPTS OF RESOURCE ALLOCATION

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INTRODUCTION

The resource allocation process is used to allocate resources within an organisation. The process eventually controls which strategic actions are taken within an organisation. Therefore the resource allocation process is considered to be the process defining the actual strategy [Bower, 1970; Mintzberg, 1978; Maritan and Lee, 2017; Sengul et al., 2019]. Managing the resources effectively has organisational and societal relevance as resource allocation results in innovations being executed. The executed initiatives contribute to organisational continuity but also deliver solutions for real world problems, e.g. solar panels. The current problem is that there has been a lot of research to the resource allocation process but scholars mainly focused on the external factors challenging specific case studies. The internal relationships within the resource allocation process have not yet been discussed. Bower [2017], who is a founding father of resource allocation research, stated that the current research methods do not satisfy the research towards the relationships between the resource allocation mechanisms. Bower and Gilbert [2005] published the revised model of the resource allocation process, see figure 0.1. This is currently the leading definition of the resource allocation process.

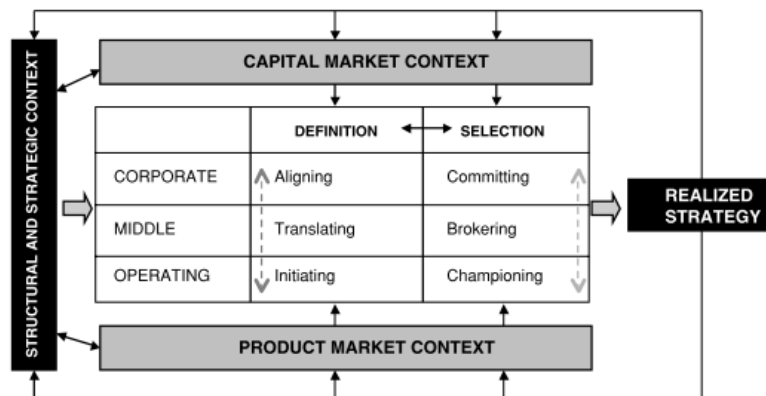


Figure 0.1: Revised model of resource allocation by Bower and Gilbert [2005]

The main limitation of the revised model (figure 0.1) is that the processes are not defined in detail. This is due to the fact that they could be different for each organisation. Recent research of de Planque and aan het Rot [2020] resulted in a definition of an agent-based model. The research revealed that definition of a generic agent-based model was not easy. Therefore the research objective is to construct a generic agent-based model of the resource allocation process.

METHODS

The main method used for this research has been the model-based approach. The model-based approach has been used to define an agent-based model of the resource allocation process. The research started with a literature research to the internal behaviour mechanisms, and sub-processes. Bower and Gilbert [2005] had

been a great starting point for understanding the resource allocation process theory. In order to support the theoretical explanation of the resource allocation process, the book of [Burgelman \[2002\]](#), described a specific case study executed at Intel corporation. Within the description of the Intel case study, several sub-processes are explained with real life examples. The managerial mechanisms which are used within the Intel case are explained in the book of [Simons \[1995\]](#). Simons discusses both the control mechanisms but also elaborates about organisational learning. Organisational learning is where the employees of the organisation function within the resource allocation process and learn about their environment. This has to do with the definition and selection processes of the resource allocation process. The principles of organisational learning have been described in the book of [Axelrod and Cohen \[2001\]](#). These mechanisms are used within the resource allocation process for the exploration of the environment. [Page \[2017\]](#) introduced the concepts which illustrate the effect of diversity and communication, which he defined as the diversity bonus. To understand the concept of decision-making, the book of [March \[1994\]](#) has been used. This literature, in combination with some additional literature research in a literature database, constructed the foundation of understanding the resource allocation process.

When the foundation of understanding the resource allocation process has been constructed, the objective of designing a model was defined. There currently is no generic detailed description available of the resource allocation process. Therefore, the constructed model functions as an explanation where plausible mechanisms are used to match a theoretical outcome in a well-defined manner [[Edmonds et al., 2019](#)]. The literature research resulted in conceptualising, formalising and implementing the resource allocation process. If any knowledge appeared missing, additional literature research had to be done. The conceptualisation, formalisation, and implementation have been thoroughly discussed with an expert in the field.

RESULTS

Since the model's purpose is to function as an explanation of the resource allocation process, the conceptual design of the resource allocation process in figure 0.2 is the first result of the research. The resource allocation process is executed within an organisation, by three hierarchical management levels: a corporate manager, division managers and venture leaders. Each management level executes their own processes to work together and invest resources into investment opportunities. The executed investments are called strategic actions, and are based on the properties from the market they operate in. The external context, consisting of the capital and product market context, define the behaviour of the market the organisation operates in.

Each of these management levels, represented by agents, run their own Definition and Selection processes, which together form the actual executed strategy of an organisation. How these processes are executed is defined by the internal context of the organisation. The internal context thus defines the strategic actions which are executed within the resource allocation process. The strategic actions can be divided into *autonomous strategic actions* and *induced strategic actions*. Autonomous strategic actions are actions which are not in line with the corporate strategy, while the induced strategic actions are in line with the corporate strategy. Within the internal context there are two mechanisms; the *Structural context* and *Strategic context*. Changes in these mechanisms can influence whether an organisation is leaning more towards *Structural context determination* (which results in more induced strategic actions) or leaning more towards *Strategic context determination* (which results in more autonomous strategic action).

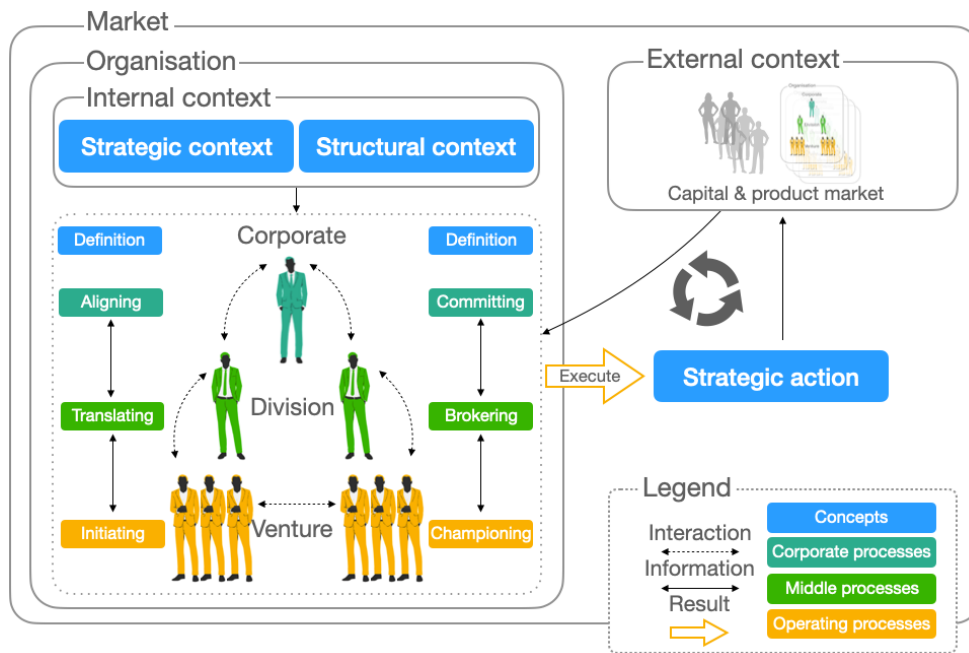


Figure 0.2: Conceptual design of the resource allocation process

THE CONDUCTED EXPERIMENTS revealed that the implemented model is able to reproduce a multiple phenomena. Model setup which is orientated towards extreme strategic context determination resulted in a significant increase in autonomous strategic action when compared to a model setup with extreme orientation towards structural context determination. This means that the implemented model is able to reproduce the most important aspect of the resource allocation process. With this result the next phenomena could be tested and resulted in the proof that strategic context determination performs better in a complex environment. The influence of expanding the opportunity space (i.e. the opportunity venture leaders get to diverge from their core business), resulting in an increase in autonomous strategic actions, can be reproduced by the model. With an increasing opportunity space, resulted in more autonomous initiatives initiated, committed and executed. The initiated initiatives show the functioning of the opportunity space, but the championed initiatives reveal that there are a lot of great opportunities which lie a little further from the core business of the venture leaders.

Two phenomena which could not be reproduced by the model as-is are the effects of communication and diversity. Increasing communication should, according interpretation of the literature, increase the autonomous strategic actions. The model has been able to reproduce this for the initiated autonomous strategic actions, but was not able to show a significant difference in executed autonomous strategic actions. An increase of diversity within the organisation should also increase the executed autonomous strategic actions. The model was able to reproduce this effect, but as the level diversity increased (more heterogeneous agents) the output of autonomous actions decreased. Therefore these phenomena are considered to not be fully reproducible with the model as-is.

DISCUSSION

The constructed agent-based model can be seen as the first version of a great tool. The agent-based model defines the resource allocation process model of Bower and Gilbert [2005] in much more detail. The implemented model reveals that the core mechanisms are functioning according expectations, thus functioning as a great ba-

sis for further research. The internal context can be set to a specific context. While only two extreme options of the internal context have been tested, the outcome of the model was as expected. With the help of this simulation model future research can be conducted on the effect of the available mechanisms which influence the context. With the results of future research and possible improvements of the model, professionals and scholars will be able to simulate specific organisational settings in a specific context. Therefore the exact proportion of strategic action can be determined. These proportions can be determined by testing the differences in outcome resulting from the differences in internal context settings. The effect of single mechanisms and specific combinations could lead to an optimisation of the resource allocation process. Optimising the resource allocation process would result in more frequent and efficient investments. Resulting in value creation for organisations and possibly critical innovations for society.

Unfortunately the model as-is can not be used for these purposes. There still are some insecurities about the effect and correct implementation of the communication within an organisation contributing to the resource allocation process. As the result of the current research delivered an insignificant difference. Also the diversity option within the implemented model is not functioning according expectations. The diversity is likely to be a modelling decision which does not deliver the results as expected. Additional research should reveal if this problem can be solved.

CONCLUSIONS

The theory which best describes the internal context is the evolutionary theory of [Burgelman \[2002\]](#). The structural context determination causes induced strategic action to occur, while autonomous strategic action is the result of strategic context determination. Influencing these contexts happens through setting target boundaries, size of opportunity space, communication, and the decision preferences of the agents in the model. The conceptualisation as illustrated in figure 0.2 is considered a model which is very suitable for researching the relationships between the mechanisms of the resource allocation process. Before this research can be conducted, some concepts still have to be reviewed. These concepts are the communication and divergence concepts. In addition to the parts which need to be reviewed the model setup has to be evaluated. The current research settings have been a result of trial and error, which resulted in a functioning model. But these settings need to be developed further to be sure about the settings.

As recommendations for future work, it would be very useful to research the specific reason why the model was unable to capture some phenomena. A factorial analysis would test the effects of the variables on the outcome of the simulation, which could help improving the model. Last recommendation would be to further develop fitness landscapes which are more realistic for comparison with real life situations. With additional more realistic landscapes the boundaries of the resource allocation process can be explored.

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