

The Decision-Making Process in Jaguar Land Rover Nitra

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Abstract. This paper deals with the managerial decision-making models used in automotive industry, particularly with the bounded rationality and political model. The subject of our study is the Jaguar Land Rover (JLR) Industry 4.0 manufacturing facility in Nitra and the relationships within this organization. The aim is to identify what models are applied in particular scenario and the impact of managerial data inconsistency on the political decisions. The analyze is based on the official corporate data, organizational structure, study of corporate processes, but mainly on un-structured data, i.e. interviews and questionnaires with people on all levels of organization structure within the period of two years from plant startup up to stable operation

Key words: Decision Making, Bounded Rationality, Political

1 An Introduction to the Decision-Making

1.1 The Role of Decision-Making in Organizations

The importance of decision making on organizational performance has been discussed by a countless literature, but it was the management science pioneer Herbert Simon who wrote in his book *Administrative Behavior* [1] for first time that decision making was introduced as a focal point for studying organizations, means a key factor of corporate success. In our paper we keep focusing on this aspect of organization.

To structure our organizational decision making analyze we have helped ourselves with the very popular concept of meeting minutes writing so called "3W", that stands for **what decision** should be done, **when** and **by whom**. The aim is to describe what decision-making models (see 1.2) are being used within an organization, when and on what management level are those ones taken.

The essence of management is to manage the workload. The organizational units face a huge number of tasks and it is usually not feasible to fulfill them all, therefore the managers need to somehow prioritize the tasks of his subordinates. Stephen Covey

offers the framework (**Fig. 1**) to categorize them into four quadrants and deal mainly with those in Q2. These are tasks that are not urgent, but important for performance and includes activities like proactive work, learning, planning or building relationships. He claims working mainly in Q2 will help managers to improve both productivity / quality of work as they have more time for making important decisions.

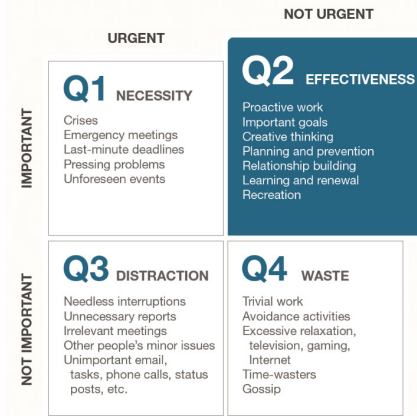


Fig. 1. Stephen Covey's 4 Quadrants [2]

As suggested by **Fig. 2** there are three management levels with a corresponding type of decision making found in organizations.

On the top of the pyramid there is a Strategic decision (SD) making. Mintzberg [3] defines as strategic those decisions that are important in terms of actions taken, the resources committed, or the precedents set and which are usually made under uncertainty and do not have programmed solutions.

Tactical decisions (TD) refer to short term or daily based decisions. Tactical decisions affect mostly one specific plant department (e.g. quality or engineering) as the scope of the data used is much more specific than in strategic decisions.

Operational decisions (OD) are used in organizations on daily base, usually on the line (operational) management level.

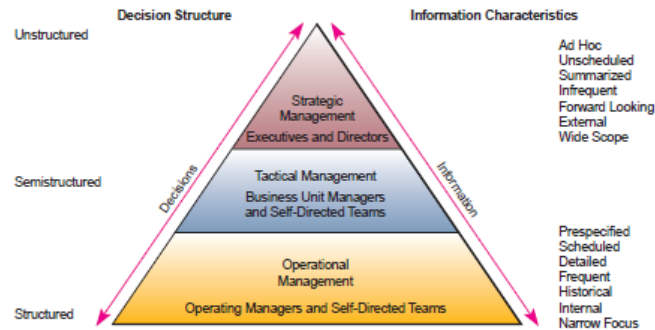


Fig. 2. Information requirements of decision makers [6].

1.2 Decision-Making Models

Kennerley defines decision making as the cognitive process leading to the selection of a course of action among alternatives. Every decision-making process produces a final choice. It can be an action or an opinion. It begins when we need to do something, but we do not know what. Therefore, decision making is a reasoning process which can be rational or irrational and can be based on explicit assumptions or tacit assumptions. [7].

In the decision-making literature, decisions have been classified according to decision types. A distinction is made between structured and unstructured decisions or, as introduced by Simon, between *programmed* and *non-programmed* decisions [5]. Decisions are programmed to the extent that they are repetitive and routine, to the extent that a definite procedure has been worked out for handling them so that they don't have to be treated from scratch each time they occur [8]. Programmed or structured decisions involve well-defined, measurable and compatible criteria, while non-programmed or unstructured decisions come under the heading of "problem solving" (Simon 1977). On the other hand, decisions are non-programmed to the extent that they are novel, unstructured and unusually consequential [5].

The literature suggests four major streams in decision making: **rational, bounded rationality, intuitive** (judgement) and **political** decision making.

Another approach to the decision making is commonly known as intuition or judgement. Within this paradigm the subjective probabilities are numerical expressions of beliefs concerning uncertain events that may be assessed using heuristics that reduce complex computational tasks to simpler judgmental ones [9]. Such intuitive judgement can be economical and effective, but it may also lead to severe and systematic error [9].

The competition for scarce resources and the pursuit of different goals make the organizational decision-making process inherently political. Many writers have pointed out that decision-making may be seen more accurately as a game of power in which competing interest groups vie with each other for the control of resources. [5].

Fig. 3 presents the variance model of the political aspects of strategic decision making that categorize the factors of organization and its environment, political behavior and consequences for organizational performance. The first stage in the model identifies antecedent conditions that are likely to promote political behavior in strategic decision making. The variance in the form and intensity of political behavior associated with strategic decision making is likely to be predicted by relations with external organizations, organizational characteristics, and the nature of the strategic decision in question. Political behavior, in turn, may be characterized in terms of its form, such as lobbying, cooptation, and the use of power over strategic contingencies, and its intensity. The second stage in the variance model concerns the impact that political behavior has on the outcomes of strategic decision making. The model suggests negative impact of politics on both decision quality and organizational performance, due to features such as the manipulation of information and the delays and additional costs incurred. However, some results also suggest important qualifications to this conclusion. One qualification is that it depends on whether managers have the skills to handle conflict and political behavior constructively so that it produces a diversity of arguments while preserving a collaborative culture. If they have such skills, active organizational politics

may assist an organization to learn and adapt. By stimulating greater interest in the process of strategic decision making, an active political process may also lead to a more careful definition and planning of an organization's strategy. Also, proactive political moves towards consequential external parties may secure support for an organization's strategy.

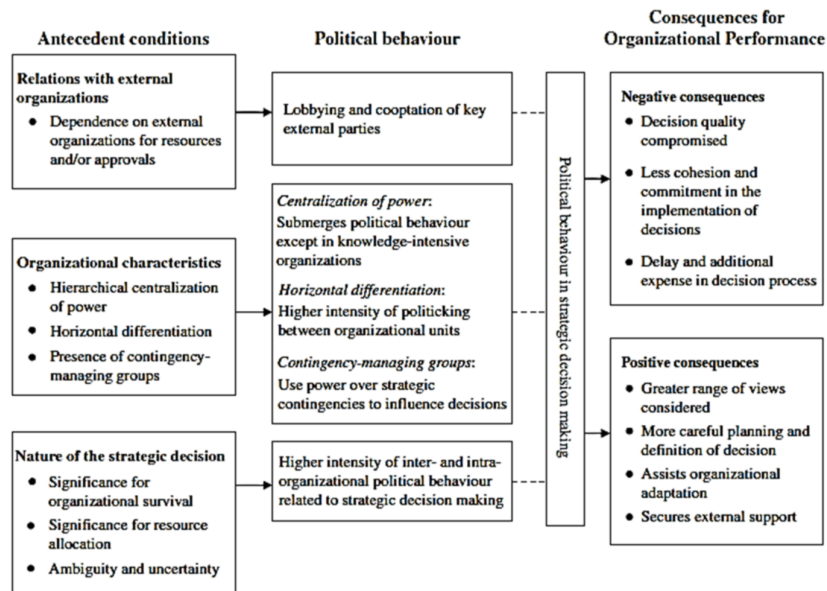


Fig. 3. A variance model of the political aspects of strategic decision making [10].

1.3 Analytically Supported Decision-Making

With the development of IT and statistical tools the business analytics became an integral part of decision-making process. Analytics may be implemented in resolving both structured (using business intelligence) and unstructured problems (using business analytics). Schniedermand suggests the analytics process can solve problems and identify opportunities to improve business performance. As depicted in Fig. 4, the business analytics process has an inherent relationship to the steps in typical organizational decision-making processes. This model suggests using the predictive analytics tools to define the problem and prescriptive statistics to resolve it.

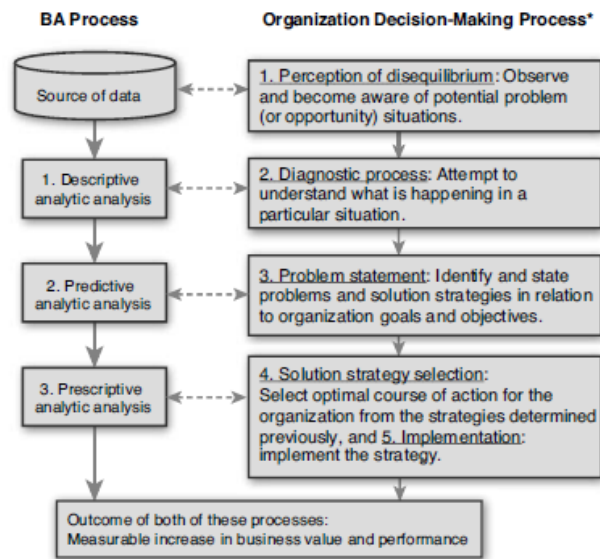


Fig. 4. Analytics and organization decision-making processes [11].

2 Characteristics of organizational structure and management practices in the researched company

The subject of our study is the Jaguar Land Rover (JLR) manufacturing facility in Nitra. JLR considers it's most recent plant completed in 2018 as a corporate flagship, an Industry 4.0 plant with state-of-the-art technology. This plant currently employs over 3000 people while producing two carlines.

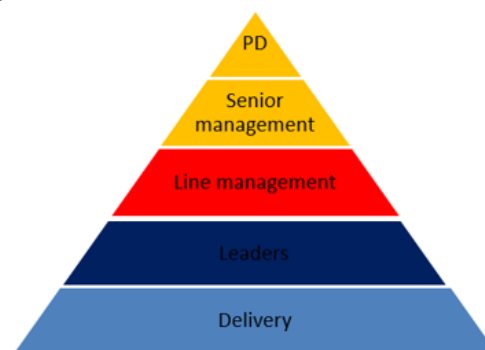


Fig. 5. Management and working levels

The analyze is based on the official corporate data, organizational structure, study of corporate processes, but mainly on unstructured data, i.e. interviews and questionnaires with over fifty people on all levels of organization structure within the period of two years from plant startup up to stable operation.

A pyramid (**Fig. 5**) shows the levels of management and technical staff within this plant. The top two levels include the plant director (PD) and senior (tactical) management, while the middle one represents the first line (operational) management. The fourth level represents the lead engineer level which is a hybrid between a “real management” and delivery level as they are delegated to utilize assigned members of the delivery level. The delivery level represents engineers, workers and supportive staff.

A very simplistic split of organizational core activities shown on **Fig. 6** considers the material planning and delivery, engineering support, final assembly and quality (supporting activities like HR, finance, legal, etc. are not even shown here). The more detailed classification distinguishes three manufacturing units (body shop, paint and final assembly) each with several other departments. Engineering department for example consists of 6 departments (body, electrical, etc.) and quality consists of three departments. In general, all these departments are further split into serial production and new model launch. In the end it counts for around 15 seniors sitting in Nitra (in addition to many others on corporate level) and over 50 line managers.

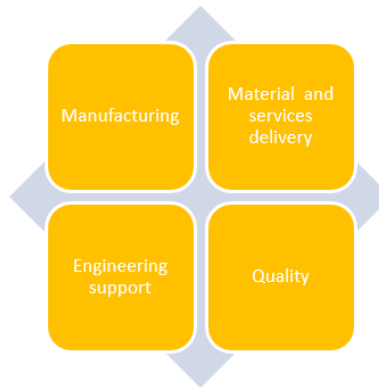


Fig. 6. Main activity areas within the production plant

Theoretically, all the processes and working instructions have been transferred from other JLR plants and UK headquarter; and adopted by JLR Nitra. In reality employees claim the availability or quality of these processes from the following reasons: incompleteness, obsolescence, access rights, local legislation or local language translation. The majority of claims are related to the fact that brand new Nitra plant use different technologies and manufacturing process, therefore the original procedures are no longer applicable. Additionally, the staff is not skilled enough comparing to those in UK plants; therefore, more detailed procedures are required.

A particular issue within the process management is the communication. There are basically three types of managerial communication: top-down, horizontal communication between departments and internal team communication. This communication is performed using several communication channels depending on the number of senders/receivers, importance, access restrictions, department particularities and analytical maturity of those involved in communication. The communication tools in use are: emails; phone calls; meetings and minutes; dashboards and scorecards; engineering release notes; communication and reporting applications.

Organization with 3000 employees, almost half of them daily create or process any type of electronical business data. Major part of this data is shared across the organization which is the major contributor to creating data redundancy and inaccurate data silos. Another point of view is an internal data need by individuals. In average a line manager receives over 100 emails a day and their calendar invitations in general exceed the working time twice while personally attending in average 6 meetings a day. The data produced by his subordinates are not even counted here. After a couple of months is hardly to manage such volume of information.

As part of the study the motivation of employees has been surveyed as well. The most common reasons for joining JLR was the corporate reputation, income expectations and opportunities for career growth. The employees with previous automotive background have expected more friendly working environment. There is a significant population of people who used this opportunity to relocate back to Slovak republic after several years spent by working in UK. On the other hand, the significant fluctuation is mainly caused by the setting of reward system and unfriendly working environment. The engineering and management positions tend to leave the company due to work pressure and claim their involvement in decision making processes comparing their UK colleagues on the Nitra assignment.

The major source of complaints coming from all level of organization are related to the manufacturing inputs availability, cultural differences, testing and software tools, information inconsistency, political behavior, communication overload or in opposite the lack of data required for decision making.

3 The Research Results

Within the application part the decisions making process is in analyzed through both the project performance as well by analyzing the questionnaires filled by managers and lead engineers.

In line with the Covey's four Quadrants we have defined four categories of projects, depending on their urgency and importance for the company. The first category are so called "line stoppers". This are the problems that cause production outage and require immediate response. In addition to those there are some "mis-builds" (wrongly produced cars that need to be reworked prior to selling them) included here as well.

Second category is formed by projects associated with the corporate strategy, i.e. assuring the acceptable product variability. These are important engineering, part quality and process issues.

The third and fourth category of projects are theoretically not relevant for this analyze as they are usually low priority ones, but sometimes it is not easy to distinguish between issues in Q1 and Q3. This is particularly true under the conditions of information overload and absence of measurable quality standard. Typical example is the complex vehicle software functionality.

To reflect the nature and complexity of today's premium cars the analyzed data contains mainly the electrical and software related issues (around 90%), nevertheless the subject of this study that is a decision-making process is observed on the various departments, namely final assembly and testing, engineering, quality, supplier technical assistance, material planning and logistics. While the Q1 issues come from production/final assembly the Q2 issues are also originated by quality department, corporate fleet drivers and customer warranty claims.

The study of top 10 electrical and software Q1 projects (by volume of resources involved in problem solving) in 2019 found in 30% of cases there is no issue at all just a misinterpretation of data. The same study also showed another 50% we caused by poor material planning and logistics. Although the average involvement of this department in Q1 problem is 2 weeks with equivalent of 2 engineers full time, only 2 out of 10 problems were owned by engineering. As consequence the study declared full impact of Q1 problem solving on Q2 project planning, means each Q1 problem will delay other team activities in average by 150 engineering ours. One could argue this is a tenuous report, but the key information here is each Q1 problem affects 6-8 departments. In average it directly involves 40 – 60 people, including 5 – 10 line managers and at least 3 senior managers. It is discussed on 3 senior meetings and up to 10 management or working meeting every day. Within the life cycle an average problem is owned by 3 different departments. If there is an owner change on Q1 project in mainly happens within the first 7 days.

On the study of over 100 internal projects characterized as "Q2" has been found these are less likely to be transferred on the other owner more than once within the first one week. These projects involve manufacturing and design improvements from several different plants departments (engineering, quality, manufacturing and logistics). Around 93% of analyzed projects were not transferred from original owner or transferred just once. On the other hand, there is a huge variability in problem solving life cycle that is between 2 days and nearly 2 years. At least 10 repeated problems were found in the analyzed sample with a variable occurrence for more than one year. A detailed look at the problem description with the subject matter experts reveals that same symptoms are described in several online analytical and historical record tools for a long period of time, but the problem statement or affected system is different.

The Q1 problems/projects have incomparably shorter lifetime than Q2 projects. This can be explained by huge expenses on line stop or urgent car reworks and consequent senior attention. In this case significant resources are reallocated to resolve or at least to contain these problems. The problem translation from Q2 to Q1 cause 3 – 8 times more people involved in problem solving. It allows production running, however there

are also side effects of this approach like inefficient resource allocation, delay in other projects and information overload with a negative impact on overall corporate performance and relationships. The frequency of changing the problem owner within the first days can be explained by playing political games within various department.

By questioning the operational managers and lead engineers who directly interact with the data it has been found that major source of their complaints is related to the data accurateness, information inconsistency, communication overload. More than 10 official JLR applications and countless number of personalized applications with the overlapping information has been identified within the company, creating the data silos and forcing staff into intuitive decision making.

Another significant claim contributor reported was the political behavior. One of the observations on this topic is that knowledge workers in the departments with the highest fluctuation rate claimed the poor support from their manager and at the same time they were more likely to claim the political decision making within the organization. The managers personal relationships, lack of assertiveness and existence of data silos within departments have been identified as primary contributors to the political behavior.

By questioning the people it was found that political decision making is more likely at the senior management level (nearly all seniors confirmed they are involved in certain level of political decision making or consensus) than on operational or working level while the lower management levels and knowledge workers tend to use bounded rationality or even intuitive decision making

4 Conclusions

The study found the significant impact of the production outage issues on the overall organizational operation and performance of other running projects. To improve the overall organizational effectivity as well as employee satisfaction, we suggest to systematically improve the proactive work, goal setting, planning and crisis prevention (working in Q2) isolate the problem

By questioning the employees, the variance model of the political aspects on horizontal differentiation validity has been confirmed for JLR case where the significant impact of political decision making has been claimed by staff across the whole organization. The root cause of this phenomena is assumed in organizational immaturity, particularly in unclear responsibility, poor adoption of internal processes and inconsistent business intelligence system with many data silos providing inconsistent data across the organization. The suggestion to improve the performance in this area is to implement a common business intelligence system, a “single version of true”, that would include material, manufacturing, testing and warranty data, would be accepted by all corporate departments and automate decision making process to minimize the human intervention.

Another observation is that political decision making is more likely present at the senior management level than on operational or working one while those tend to decide based on the data from the data silos in their departments or even intuition. There are even several online analytical tools available for the production control, however due

to frequent network overload or uncontrolled change management these are often abandoned by staff.

We have also documented many cases where the formal decision making was performed post act, e. g. after the intuitive decision was taken, just to get the formal arguments for senior meeting or confrontation on horizontal level.

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