

We have to integrate to engage in change: exploring sustainable project management

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Abstract

Recognising that sustainability in project management is a nascent field. For the need to build integrated models to support the development of an accepted school of thought, this paper uses the Deception Impact Model to explore the impacts from the current Boeing 737 MAX case to explore the impact of deception in the context of different phases of sustainable project management: product design, certification, and training. We highlight the importance of tracking deception in sustainable projects considering the severity of deception as the project moves through different stages and its impact on stakeholders and broader society.

Keywords: Sustainable project management, Ethical Practice, Deception,

Introduction

Sustainability in project management is a nascent field. Currently accepted schools of thought in project management include the optimization school, the governance school, the success school, the decision school and the process school. When analysing the components of a school of thought, three criteria defining a school are commonly acknowledged. These incorporate a shared vision or perspective and common methods and tools, a community in relation to an established publication base, and finally impact in terms of integration into practice and standards (Silvius, 2017). Recognising the global community acceptance of sustainability per se, evidence of increasing research and publication in this area (Silvius and Schipper, 2014; Silvius, 2017), and viewing the emerging discussion in terms of impact and integration of practice and standards (Hammadi et al., 2018; Silvius, 2017), it could be claimed that sustainability in project management is an emerging school. To further elaborate on the characteristics that

define the sustainability school of thought, Silvius (2017, p. 1491) presented four commonly shared characteristics relating to the criterion content: considering projects in a societal perspective, having a management for stakeholders approach, applying triple bottom line (TBL) criteria, and taking a values based approach to projects and project management. Thus having established the existence of the sustainability school of thought in project management, it is incumbent on researchers to explore the relevant criteria to develop and build the school of thought.

Hammadi et al. (2018) demonstrated the outcome of activities within business as being increasingly far-reaching and impacting at societal levels, they questioned the upstream and downstream impacts of activities on stakeholders and customers in the context of supply chain activities, investigated how this related to the triple bottom line of an organisation and queried organisation's taking a values-based approach to decisions at the strategic and operational levels. An outcome of this approach was the establishment of the use of deception often resulting from a gap between strategic CSR or sustainability goals and implementation of standards and practice. Indeed, one of the dangers highlighted by Prasad and Holzinger (2013) is the false implementation of CSR in companies and their projects as this runs the risk of turning this sustainable strategy into a simple marketing strategy that helps the company to make money without really inserting it in their processes and projects." (Marcelino-Sádaba et al., 2015).

The result of the integration of these dimensions when applied to ethical decision making in operations provided the foundation for the development of the Deception Impact Model (DIM). Drawing of this model and the principles of sustainability - economic, social and environmental - the aim of the current study is to explore sustainable project management by examining the current case of the Boeing 737 MAX, a project increasingly exhibiting the antecedents in terms of deception at a range of product design phases and project life cycle stages that clearly demonstrate that this project is not sustainable due to the use of deception.

The latest events of the Boeing 737 MAX demonstrate the disadvantage of the project (with 346 death on two flights/crashes - 157 Ethiopia/189 Indonesia) direct outcomes and the delayed impacts these might have on the triple bottom line. Project looks good, one event shows that the planning and execution might have involved deception to "cut curves". The aftermath investigations reveal a lack of control, external independent inspection, stakeholder satisfaction, market competition, and downgrading risks.

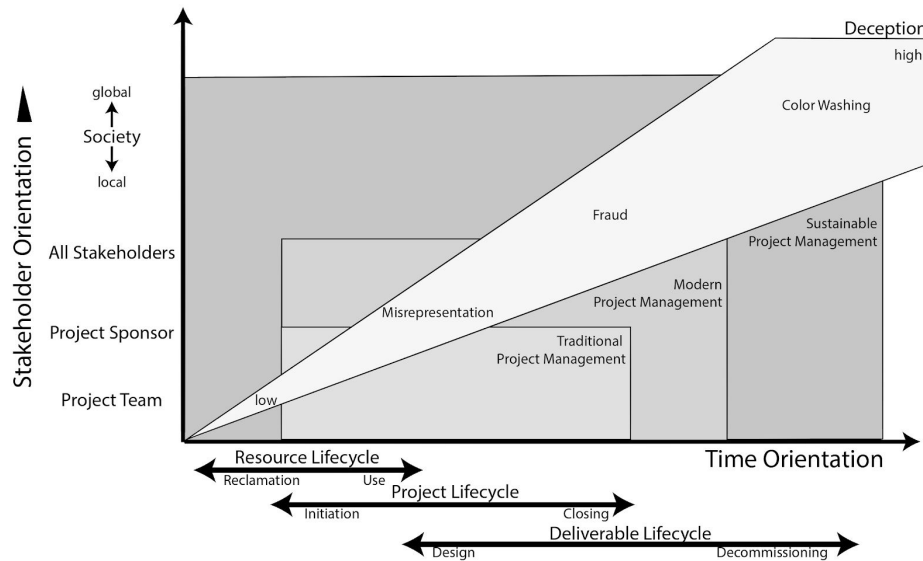


Figure 1: The broad scope of sustainable project and severity of deception (Figure adapted from (Silvius et al., 2017))

New product development projects from a supply chain point of view include upstream and downstream stakeholders. New product development projects for sustainable products are complex, mainly due to the challenges of integration of sustainability dimensions into the processes of project management. These challenges include engaging stakeholders, project procurement, project risks, project communication, and the determination of the project team (Silvius, 2017). Not integrating sustainability dimensions may result in the end product that achieves project outcomes for one dimension of sustainability but at the cost of other dimensions. The gap between stated sustainable objectives and actual outcome of the project (not integrating all sustainability dimensions) is termed as Color-washing which is a form of deception. Figure 1 depicts that projects are difficult to manage if we include sustainability requirements and involve stakeholders globally. We notice that with small group of stakeholders or in a close group in a project the severity of deception is not high. But as we involve many stakeholders globally, severity of deception may increase because of the fact that aims of these stakeholders may be conflicting, so it is difficult to obtain sustainability outcomes from sustainable project management. In sustainable project management, stakeholders role is important in determining the sustainability objectives of the project. It is not an easy job, since the interests and aims of the stakeholders in a project may be conflicting and give rise to deception. The role of the focal firm is to balance/integrate these objectives by focusing on operations or by changing operations.

The purpose of this paper is to highlight the importance of tracking deception in sustainable projects by considering change in severity of deception as project moves a focal firm from one state to another state and to determine the impact it has on consumer.

Background on Project Management

Projects in operations management are characterised by their unique and generally resource-constrained objectives to implement organisational change. Projects are driven by exogenous factors to initiate a response to a changing situation or environment, with the expectation to exert positive impact for the executing organisation. Project,

operations and supply chain management are closely related, projects are often considered as the start of operations and have similar functions, if not identical, to those performed in operations management (Waller, 2003).

Projects, or their proposals, can be the response for an external future opportunity (e.g. bidding on large construction projects), changing market situation (e.g. changed competition on primary markets), or organisational change (new manufacturing process, change of strategy or management). Projects and their objectives must contribute to the corporate strategy, and it is successful when these objectives are accomplished within the given constraints. Projects are unique and temporary, involve many non-routine and complex tasks for specific deliverables or work products, and therefore face heightened levels of risks and uncertainty when contrasted with day-to-day operations (Slack and Brandon-Jones, 2018).

Managing a project often requires trade-offs and compromises, to ensure successful completion of the project. It also requires the ability to solve problems, set goals, and compromise. It is these goals that determine the process of planning, testing, evaluating and monitoring the improvement progress. A complex project requires a more detailed and comprehensive scope. Strong commitment in the definition phase of the project life cycle can result in less room for later changes during project execution and cause a team “lock-in” status, encouraging the team to find short-cuts if milestones cannot be achieved.

Climate change and therefore focus on sustainability has brought sustainable business practices to the forefront. Corporations today are under pressure to maximise returns for investors and need to conduct activities that are less detrimental to the environment and society. Project managers have to commit to the concept of Triple Bottom Line and implement sustainable practices to fulfil this. Multiple stakeholders, both public and private, are often acting with conflicting interest and different levels of influence are involved in the decision making and planning process (Aaltonen and Kujala, 2010). Furthermore, different user stakeholders have different internal opinions and are likely to have different interpretations and expectations of what will be produced (Atkinson et al., 2006).

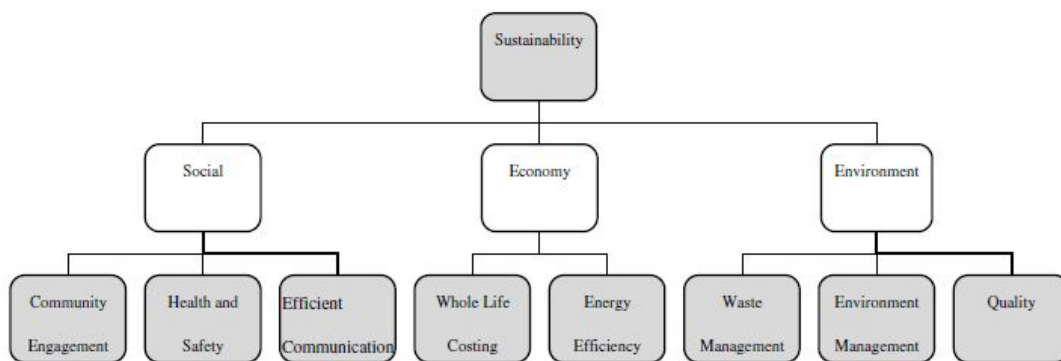


Figure 2: Criteria for sustainable project management (Source: Wang et al., 2014, p. 248)

Silvius and Schipper (2014, p. 79) define sustainable project management as “the planning, monitoring and controlling of project delivery and support processes, with consideration of the environmental, economic, and social aspects of the life cycle of the project resources, processes, deliverables and effects, aimed at realising benefits for stakeholders and performed in a transparent, fair and ethical way that includes proactive

stakeholder participation.” Wang et al. (2014) summarises this clearly in Figure 2. Many definitions of sustainability encapsulate the intergenerational aspect to meet the present needs without harming future generations to meet their own needs (Bruntland, 1987). Sustainability ensures that the project contributes to the sustainable business of delivering goods and services for the project duration and to the future generations (Tufinio et al., 2013), thus ensuring the project lifecycle is integrated in sustainable project management. The United Nations also recognises the global importance of sustainability in the UN 17 Sustainability Development Goals (United Nations, 2015). SDG 12 of the 2030 Agenda for Sustainable Development aims to ensure sustainable consumption and production patterns along the entire supply chain “needs to be significant focus on operating on the supply chain, involving everyone from producer to final consumer” (United Nations, 2015).

Contrasts in characteristics between project management and sustainable project management relate to time orientation (short vs. long), intergenerational interests (stakeholders vs. future generations), objectives (deliverables vs. life-cycle), scope (time/budget vs. people/planet/profit), and complexity (reduced vs. increased) (Silvius et al., 2012, p. 167). This establishes the need to investigate the integration of sustainability and project management in an ethical approach, addressing the economic, social and environmental goals of the project whilst acknowledging the project stakeholders. Such a challenge requires exploration of customer impacts, deception, and implementation of TBL whilst acknowledging the characteristics of project management.

Emerging competitive markets and government regulations can compel organisations to meet certain standards. State agencies are responsible for the enforcement of public regulation have had very limited influence over corporate practices (Santos et al., 2017). On the other hand, the government agencies lack the capacity to enforce increasingly complex policies of environmental and sustainable development legislation (Labonne, 2016). Often the practice of industries engaging in self-monitoring with their measurement leading to the industry cutting corners to deal with growing economic pressures.

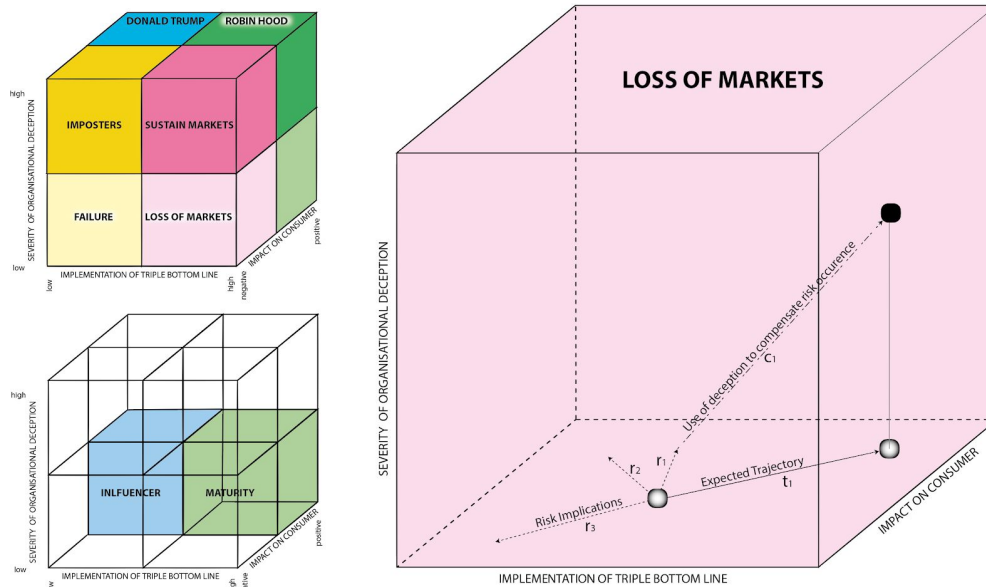


Figure 3: Deception Impact Model (left) and example for project trajectory (right)

Deception Impact Model for Project Management

The Deception Impact Model (Hammadi et al., 2018) is to set the severity of deception in the context of how organisations recognise the TBL as a strategic value and how consumers perceive the organisation. Figure 3 shows on the left the distinguished cubes describing the states we consider for an organisation; see Hammadi et al. (2018) for more details. The dimensions (deception, TBL, impact on the consumer) can be seen as a driver (progressive transition) or risk (regressive transition) organisations face and require consideration when defining strategies or values. Project management defines trajectories from initial positions (current states) to anticipated positions (objectives) for a (positive) change along all dimensions. Figure 3 shows the trajectory t_1 from s_1 to s_2 , improving the TBL as well as the impact on consumers. The dotted vectors (r_1 to r_3) exemplify risk implications the project can experience. Here, each risk implication represents a TBL dimension; e.g. change on financial markets (economic), blocked approval due to protect animals (environmental), or causing long-lasting health impacts (society).

Even though the intention of the project is not deceptive, external causes can shift the mind toward the compensation trajectory c_1 of the occurred risk. To fulfil the objectives, it might be necessary to apply deception despite original intentions for the project; i.e., if the project might fail otherwise. As shown in Figure 1, the outcome is matching the objectives. The following section demonstrates the application of DIM using the latest Boeing scandal as an example.

Case Study Boeing 737 MAX

The current unfolding of the Boeing 737 MAX project after the crashes in Indonesia and Ethiopia with 346 deaths show how predominantly sustainability objectives caused in a chain of strategic and operational decisions the negative impact for all stakeholders including society. This section depicts the events and potential cases of deception. Information was gathered from manifold news articles, reports website; a complete list cannot be provided due to page restrictions. A starting page with references to sources can be found on Wikipedia (page “Boeing 737 MAX”).

Case Description

The market is dominated by two key competitors offering medium and large airliners for the domestic and international flight sectors. Airbus has an extended family of aeroplanes based on the same framework and, thus, requiring only one type of license to operate all variants (e.g., A318-321, A320E, A320neo). Especially domestic low-fare airlines favour operations of only one family of aeroplanes to cut cost for maintenance and operations as well as increased flexibility for crew training and assignment. Airbus' major success with the A320 family was the A320neo where more efficient engines reduced fuel consumption, emission, and noise (Airbus, 2019).

The Boeing 737 MAX project started on August 30, 2011, when Boeing under the pressure of their customers (airlines) and competitors (Airbus) decided not to develop a new aeroplane type but re-engineer the Boeing 737 aeroplanes with better fuel efficient engines. The project was thought of as a masterpiece as the new fuel efficient but larger in diameter engines initially resulted in difficulties due to the lower space under the wings and the changed aerodynamics during certain flight maneuvers. Boeing obtained (Federal Aviation Administration) FAA certification on March 8, 2017. The first delivery of Max 8 aircraft was to Malindo Air on May 6, 2017. The new Boeing 737 MAX was considered similar to other aeroplanes in the product family (Boeing 737),

thus airline pilots and crew members did not have to go through a time- and cost-intensive training program but could use digital training material as a source for handling differences.

When the project was launched, the initial aim of Boeing was to achieve 16% lower fuel consumption than Airbus A320eco and 4% lower than the A320neo through its newly designed engines. In terms of sustainability this was set to achieve less carbon emission and quieter engines.

In both crashes, the MCAS software was identified as a critical cause. Originally implemented to compensate for the changed aerodynamics problems resulting from a rushed re-design to retrofit larger engines in the Boeing 737 family, it relied on sensor data to be activated and take over control from the pilots. For both crashes, a combination of errors in the software, ineffective warning about wrong sensor reading, and lack of proper training is supposed to be the cause for the dramatic outcomes and the long-term grounding of the Boeing 737 MAX worldwide.

Failures and Deception

Regarding DIM, the corporation Boeing could be considered in the “Loss of Market” state when the project for the Boeing 737 MAX started. Here, Boeing negatively impacts on stakeholders (airlines) with no immediate response to the A320neo. The intended project objectives to develop a new plane failed to regain the anticipated impact with the stakeholders as it would not be economically feasible (negative impact on the TBL dimension). Boeing decided, despite the technological challenges, to refurbish the existing Boeing 737 with advanced engines; including the choice to cover problems in aerodynamics with software “patches”. The misinformation about the severity of the decision and potential risk was part of the design stage of the project.

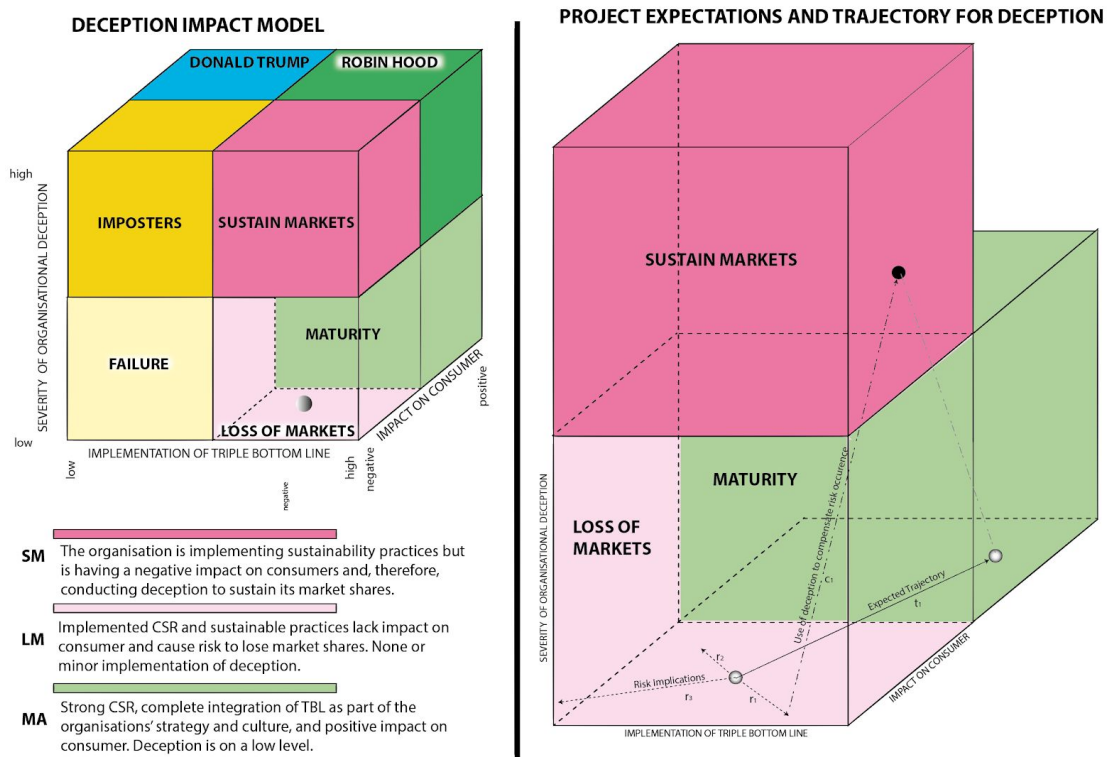


Figure 4: Deception Impact Model (left) and example for project expectations and trajectory for deception (right)

Figure 4 shows an anticipated position in the “Loss of Markets” state with an expected trajectory for the project, gain on the TBL dimension resulting from the new Boeing 737 Max) as well as having a competitive response to the A320neo. The number of orders and positive introduction confirmed the expected trajectory to the “Maturity” state; until the first incident raised negative publicity. Further, risk implications can be mapped in DIM to visualise the impact of the occurrence of a particular risk. For example, r1 represents an increase in sustainability (e.g., lower fuel consumption) but acceptance by the stakeholders (airlines, customers) is decreasing. According to revealed information after the crashes, Boeing considered that case but decided to deceive the airlines with multiple actions; see below. Figure 4 is representing the project design stage; during the project implementation the position, as well as risks and expected impacts, have to be updated.

The project Boeing 737 Max caused multiple problems throughout the product life cycle, from changing the sustainable objectives of a new plane to satisfying customers regarding a short time to market and replicating the product family extension for lower operating costs. Without replicating the full reports on this case, we depict critical incidents to demonstrate how the DIM can map Boeing over time.

In the production phase of the project, one of the main suppliers of *thrust reversers* for the engine, the **GKN**, was not able to fulfil the demand in the short period of time, Boeing switched to **Spirit Aerosystems** who is the main manufacturer of Boeing fuselage. Supplier problems showed throughout the implementation of the project; confirming the initial rush to regain competitiveness without including suppliers for the feasibility of production rates (increased from 42 in 2017 to 57 in 2019) to fulfil the customer demand (airlines)). The discrepancy between the design and production phase of the project should have been detected in the testing and certification stage.

During the testing and certification phase of the project, the FAA approved the product without much testing. The following problems were detected in the certification process. The process, on the other hand, shows the intention for deception by Boeing:

- one of Boeing’s partner, CFM International, notified Boeing during testing of potential quality issues of the engine manufacturing. Boeing largely ignored them.
- during the certification process, FAA delegated parts of the inspection to Boeing or Boeing staff working for the FAA. The main reason was time pressure, lack of qualified FAA staff, and budget to evaluate the Boeing 737 MAX.
- creation of the MCAS software to fix problems with the aerodynamics.
- insufficient testing of the MCAS software; resulting in interfering with the pilots.
- lack of redundancy for critical sensors; supportive systems sold as extras
- no training for the pilots on the critical MCAS software (or information about it).

In summary, the following trajectory for Boeing 737 MAX case can be mapped in DIM (Figure 5)..

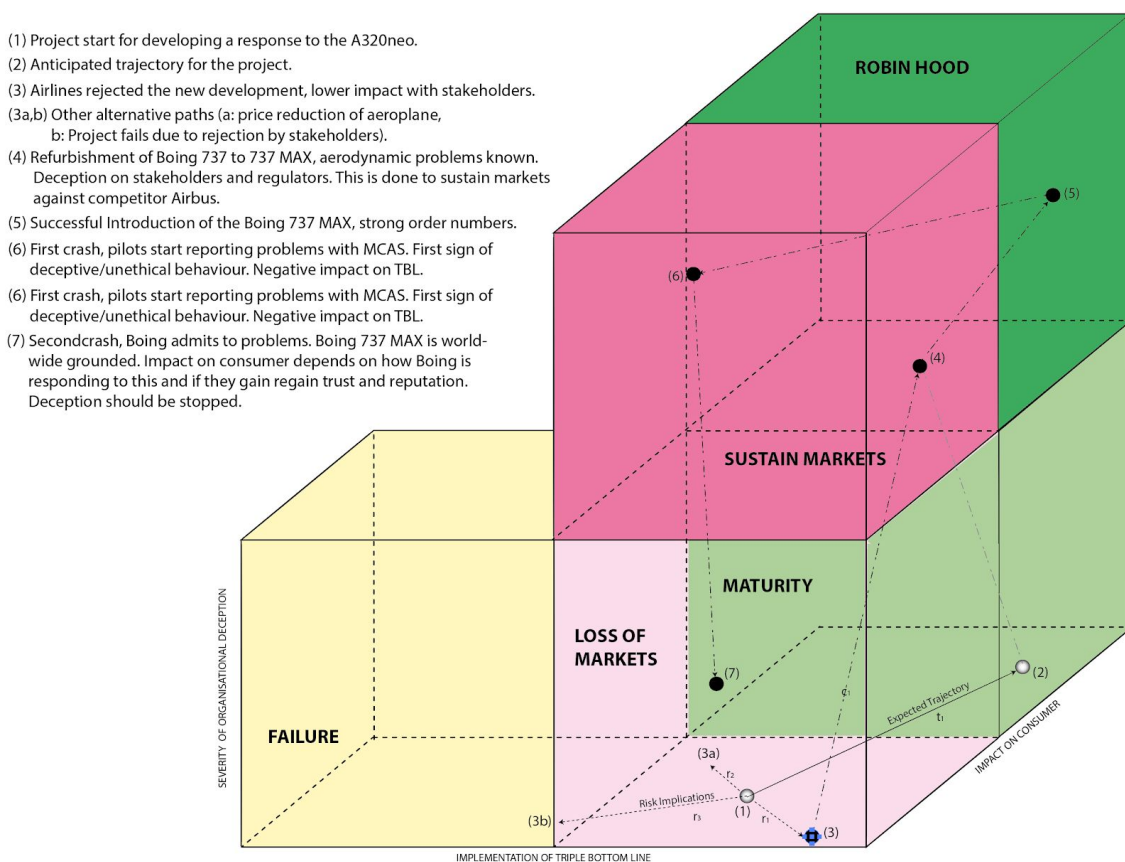


Figure 5: Trajectory of the Boeing 737 MAX project in the Deception Impact Model

Conclusion and Research Outlook

As shown through the Boeing 737 MAX case, the integration of sustainability perspectives including a societal perspective, having a management for stakeholders approach, applying TBL, and taking a values based approach to projects with project management tools provides a sustainable framework for developing impact models such as DIM. The Boeing case depicts the need for more research on mapping organisations in DIM and understand their trajectory to identify cases of deception before the damage to the TBL has happened. Boeing is one of many organisations in the recent past to admit taking advantage of disguising their malicious actions in complex supply chain networks.

This paper introduces the DIM for sustainable project management. The ongoing research is looking further into quantifying the positioning on the three dimensions in DIM using big data analytics for identifying anomalies in the literal search for the needle in the haystack.

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