

Adaptive Governance Model with a Sociotechnical Approach

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Abstract

Digitalisation is imposing a strong pace of change on the business ecosystem, which implies the need for an adaptive governance model that moves away from the mechanistic approach of Command & Control. In this sense, we have considered complexity thinking and sociotechnical systems design as the key elements for designing such a governance model. Using an Action-Research approach with international Spanish organisations, we have developed a governance model based on Agile Portfolio Management. Our conclusions show that it is possible to use this approach to create an adaptive governance model, which allows to take on business transformation initiatives, regardless of their level of complexity. At the same time, the organisation is encouraged to embrace a new working mindset, one that is more organic, more transparent and gives autonomy to staff.

One of the results of this study is bringing out how the socio-technical and complexity perspective highlights out the interdependence between governance model, operational models, organisational design, and technology architecture strategy to achieve the organisation's strategy, thereby facilitating the approach towards business agility.

Keywords: IT Governance, Agile Portfolio Management, Complexity Thinking, Sociotechnical.

1. Introduction

Digitisation is having a major impact on the business ecosystem. Elements such as digital disruption, automation, and the disintermediation of business models (Swaminathan & Meffert, 2017) are entailing major changes in business practices.

Digitalisation is strongly impacting how organisations can modulate their governance models to achieve their strategic objectives (Mulyana et al., 2021) while controlling the level of risk. Gartner's report on key priorities for CIOs in 2021 (Gartner, 2021) already indicated that the IT governance function had to move from command & control to a more adaptive nature. However, models such as

COBIT 2019 (ISACA, 2018) or ISO/IEC 38500 (ISO, 2021) are models for stable and Command & Control environments (Horlach et al., 2019).

In the context of this paper, when we refer to Agile and Portfolio Management, we are not referring to scaling Agile practices to the project level. Rather, how to design and implement a governance model of initiatives, which facilitates the organisation's ability to perceive and respond to complex environments. That is, facilitating the management of initiatives or projects of any kind, while maintaining alignment with changing business needs.

The objective of our study, using an Action-Research based design, is to implement an adaptive governance model using a Portfolio Management approach with Lean and Agile thinking, with a socio-technical perspective, to allow the case organisations to thrive in complexity.

In this scenario, we have proposed a fundamental research question to be validated through the execution of the characterisation and implementation cycle of the governance model.

Question: What are the benefits gained from implementing a governance model as outlined above, incorporating the CAS property approach and the socio-technical perspective?

In this article, section 2 provides an overview of the literature that has served as the basis for this research. Section 3 describes the research method based on Action Research. Section 4 gives the details of the implementation of the AR cycles. Section 5 describes the most important findings from the AR cycles. Section 6 shows the implications of these findings at the level of contributions. Finally, Section 7 concludes with a call for next steps for both the model and lines of research.

2. Background

We have used a wide range of reference literature on PPM, regarding portfolio management objectives (Cooper et al., 1999), (Leffingwell & Knaster, 2020), dynamic portfolio management (Krebs, 2008), and

Agile product and portfolio management (Vähäniitty, 2012).

Other important academic papers giving us a broad overview of the application of PPM at the enterprise level are: (Stettina & Hörz, 2015) which proposes 4 domains of practice for structuring a PPM process by introducing: (1) strategize and roadmap, (2) identify and funnel, (3) review, prioritize and balance, and (4) Allocate and delegate. (Ahmad et al., 2017) which provides an overview of the different tools and methods for addressing PPM processes in Lean and Agile organisational contexts and, (Puthenpurackal Chakko et al., 2021) which identified several aspects of PPM impacted by Agile delivery practices.

Traditional Governance models are frequently based on mechanistic approaches, which look at organisations as if they were closed systems. Thus, all control and planning systems are focused on predicting the behaviour of the organisation. Authors such as (Reeves et al., 2018) and (Snowden & Boone, 2007) have indicated the need to change the perspective and understand that organisations are complex adaptive systems (CAS) (Cilliers, 2000). The understanding of complexity allows us to recognize unpredictability and nonlinearity in terms of cause-and-effect relationships. Gartner's 2022 report on CIO Priorities (Gartner, 2022) indicates the need to create human-centric work environments, highlighting the need for new technologies, governance models, organisational design, and operating models to support the creation of healthy workplaces. When exploring these points, there are two elements that we have recurrently identified, namely complexity thinking and the sociotechnical approach. We have used them as a starting point for the development of an adaptive governance model.

We have taken complexity thinking as a basis, starting from Snowden's work through his CYNEFIN framework (Snowden & Boone, 2007) (Snowden & Friends, 2021), which makes us aware that different tools are required to make decisions in complex

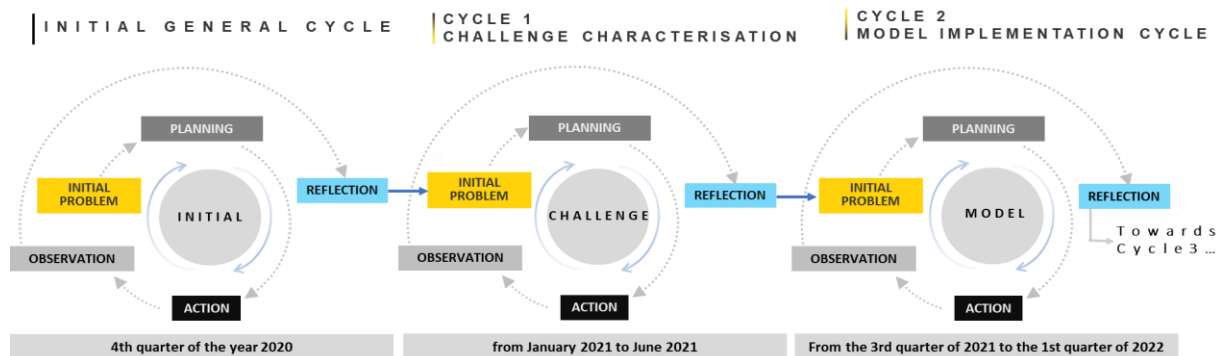
situations than for complicated or simple environments (Rogers et al., 2013).

The complexity thinking approach led us to explore complex organisational design, based on the Socio-technical perspective (Trist, 1981). This approach considers the organisation as an entity composed of three inseparable elements: (1) Social: consisting of people, their needs, culture, reward mechanisms and the relationships between all of them; (2) Technical: the capabilities, tasks, activities, processes, tools, and technology; and (3) the System itself, which is represented by the relationships of all the parts, including the ecosystem. The most important conclusion is that to increase productivity, we must look at the organisational system as a whole (social and technical). It is essential to understand that, whenever we are to introduce a new organisational change, these different elements will have different speeds, and we will have to affect all these elements in a systemic way. In this study, we consider the socio-technical perspective as a tool to facilitate change among the human systems affected by PPM processes. This approach allows us to understand that both culture and people are the most difficult elements to change, and undoubtedly, changing from a command-and-control approach to a more organic approach involves a fundamental change of mindset among management teams. We can see this reflected in (Doz, 2020), which suggests the development of Strategic Agility, as the result of the behaviour and skills of the management layer in taking and implementing strategic action.

A prominent paper is (Sweetman & Conboy, 2018), which uses the lens of CAS to evaluate current thinking on PPM, and starting from certain properties of a CAS (Self-organising, Common purpose, autonomy, adaptability, requisite variety and exchange of resource) proposes a set of proposals for managing a portfolio of projects.

With the academic and practitioners' information, we have assessed as feasible to use the Lean Agile

Figure 1 Multi-cycle structure for the implementation of an adaptive governance model



approach to design an adaptive governance model based on portfolio management. And using constructs of the socio-technical approach and CAS properties for the implementation of the model.

3. Research method and case description

A research design based on Action Research was chosen since it offers a dual purpose: to generate a benefit for the research client and, at the same time, to generate relevant "research knowledge" (Kock & Lau, 2001).

We have used the principles of canonical action research proposed by (Davison et al., 2004) as follows: (1) this study is part of an agreement between the University and an organisational design consultancy firm. (2) Following the cyclical model of diagnosis, planning, execution of action, evaluation of results and reflection on the results to continue or not with other cycles (Figure 1). (3) the theoretical objective is to create an adaptive governance model based on Agile and portfolio management principles using a socio-technical approach. (4) This study is part of several transformation projects, considering that the first author is a full-time employee of the consultancy firm and is involved in these projects. (5) For learning through reflection: for which we often use focus group strategies or questionnaires (e.g., NPS).

As we see in Figure 1, in the Initial General Cycle, was where we shaped the problem to be solved, concerning the management and governance of Agile projects in a client of the consultancy company with which the University has an agreement. This cycle was carried out in the last Q of the year 2020.

As mentioned, in the first cycle of characterisation, we carried out a series of semi-structured interviews in the organisations listed in table 1. To avoid the biases of this type of interview, on the one hand, two interviewers had to be present in each interview, and two pairs of interviewers were set up to participate in all the planned sessions. Once collected the information, they cross-checked the information, grouping the narratives together by conceptual clusters. The analysis of the narratives involved several cycles of reflection, including clarifications with some interviewees. Subsequently, an executive presentation was made to groups of interviewees to reflect on patterns that emerged. This cycle of interviews and analysis lasted from January 2021 to June 2021.

Finally, in the Implementation cycle, we designed a first version of the governance model that we subsequently began to implement. For the design of the model, based on both academic and practitioner literature, we identified the base elements or constructs to create a first version of the governance model shell based on portfolio management and Lean/Agile principals. As the pieces of the model were being built, the team of consultants validated with both organisations, which elements fit, and which did not. The objective was to find a starting point model. The actual list of companies in which we have been able to execute the implementation cycle of the adaptive governance model are detailed in Table 2.

The definition phase of a baseline version of the model was carried out during the 3Q of 2021, and the implementation of the two organisations, referenced in Table 2, began in the 4Q of 2021. The transformation project is still underway, but the results of the focus

Table 1 Reference organisations for characterisation cycle

Case / Sector	Size of the Company	Organisational model	Model of governance	Cultural atmosphere	Interviewees and roles
Banking sector company located in several Latin American countries and USA	Up to 4.000 Employee Worldwide	Hierarchical/Matrix with many levels. Agile initiatives have not been successful because of local optimisations.	Some decentralisations at BU, especially at the operational level, and centralisation at the control level, which remains at the project level. Mainly using PMI.	Formal, corporate and some tension between BU and activity-oriented areas (like finance, legal etc..)	Up to 23 professionals: - Head of PMO - PMO professionals - Business Units Managers - Heads of Product - IT Dev Managers
Banking Sector Company Spain with worldwide scope	Up to 100.000 Employee WorldWide	Hierarchical and matrix but used to all types of team topology. Agile practices widely in operation	Based on the value stream portfolios model and SAFe's Lean Portfolio Management	Informal and corporate, used to be an innovative environment	Up to 22 professionals: - Head of transformation - Transformation Manager - Manager of PMO - People and culture Managers - Business Units Managers - IT Managers
Drinks Company Spain	Up to 3.000 Employee Worldwide	Flat hierarchical and many Agile initiatives with a focus on processes.	PMI. Initiating change in the governance model using SAFe's Lean Portfolio Management	Corporate but very dynamic.	Up to 18 professionals: - Head of transformation - Transformation Manager - Manager of PMO - People and culture Managers - Business Units Managers - IT Managers
Banking Sector Company Spain	Up to 6.000 Employee Worldwide	Hierarchical, matrix Agile practices did not work because local optimisations did not thrive	Based on ePMO with a PMI approach	Formal, corporate, and traditional with a lot of competition between BU and activity-oriented areas	Up to 34 professionals: - CIO - Head of IT Governance - Manager from Legal and Compliance - PMO professionals - HR Managers - Business Units Managers - IT Managers

groups conducted at the end of the 1Q of 2022 have been taken as a reference for this paper. In order to obtain the results of the findings, different focus groups and retrospectives were conducted, in which up to 150 people participated in total. The consultants and researchers grouped the narratives according to how they were repeated. In addition, we conducted an NPS questionnaire to validate the managers' perception of the value of the new governance model.

4. Execution of the investigation

4.1. Initial General Cycle

This initial cycle arose from detecting, in an Agile transformation project, the difficulty of fitting a traditional model of managing project portfolios with the incorporation of new paradigms based on Agile. The problem grew as Agile was scaling up at the project level, and even the first changes at the organisational design level were initiated, as it showed a clear misalignment between the project portfolios and the organisation's strategy.

This led us to investigate the literature at the level of academics and practitioners to learn about the realities of other organisations and how they solved it. In general, the most important literature was mentioned in the background section. The conclusion was that it would be feasible to develop a PPM model using Lean and Agile principles.

Authors like (Puthenpurackal Chakko et al., 2021) identified six aspects of portfolio management impacted by Agile delivery practices. : (1) strategic portfolio alignment, (2) continuous delivery, (3) adaptive nature, (4) learning through feedback, (5) financial processes and (6) performance indicators. (Ahmad et al., 2017) gave us insight into the tools and methods used by industry to shape their PPMs. We appreciated a gap in the goal setting and performance management part. In this sense, we saw how practitioners such as (Doerr, 2018) o (Darino et al., 2019) encourage the use of Objectives and Key results. Even in some of the organisations we interviewed they were already using this approach and with quite good results. Although we have not found much academic literature on empirical evidence of its use. We decided to experiment with it, and use OKRs for both setting strategic goals and performance indicators.

4.2 Challenge Characterisation cycle

This process consisted of a series of interviews in a Problem-centred Interview format (Witzel & Reiter, 2012). The structure of the interviews had the following goals: (1) To clarify the corporate profile of

the interviewee and, (2) To identify the main problems with the governance model.

The aim of this cycle was to uncover the patterns that were most repeated in the challenges regarding the governance models applied.

After a short introduction to the changing and uncertain market demands and other external factors, the interviewee was introduced to the difficulty of defining a good strategy at the level of the product and service portfolio to be developed. From there, we asked about the concerns and problems they face daily. We posed questions such as: "What do you consider to be the main barriers you face in setting a strategy?". "What kind of disruptions causes the greatest misalignment between the strategic direction and the governance model?". "To what extent do the processes of monitoring, reviewing and prioritising strategy affect a successful execution?". "What level of centralisation/decentralisation exists in the organisation when making decisions regarding strategy?". "Who is involved in the product/service/solution portfolio prioritisation conversations?".

It is important to mention, that in table 1, there are companies with traditional management approaches and others that have scaled up Agile using SAFe.

In each of these organisations, we interviewed at least 20 managers from different ranks and service areas in meetings lasting about 60 minutes. For confidentiality reasons the interviews were not recorded, but the researchers documented the interviews and produced executive reports, which were subsequently shared with the interviewees.

The most prominent patterns we found are:

Elements leading to misalignment between strategic direction and portfolio management

During the interviews, we found that the biggest problem is the lack of synchronisation between Business as Usual (BAU) management and strategic initiatives. In this context, we noticed that demand is not synchronised with capacity, which leads to a loss of focus, not to mention a reduced delivery capacity. It is worth to highlight as something recurrent in all these organizations the fact that the same people attending the BAU were participating in strategic initiatives (in one or even in many of those).

Strategic thinking processes remain in an annual cycle, and as a result they are time-consuming to be very short-lived. Moreover, budgets are made on a project basis, which makes it very difficult to pivot. Any changes to the project portfolio are subject to a need for justification, which hampers the ability to move quickly.

Execution vs. monitoring and control processes vs. prioritisation of strategy

In highly hierarchical organisations, the monitoring approach follows a committee structure that replicates the hierarchical levels of the organisation. Given the "risk aversion" related to decision-making, decisions need to go through many levels of committees, which slows down the execution when problems arise.

There are many prioritisation models, but there is still a sense that everything is a priority, which is opposed to the limited capacity to deliver. Some organisations have no problem adjusting budgets to increase capacity, however, increasing capacity is not so straightforward because of factors such as scarcity of technology professionals, slow procurement processes, etc., and because the addition of new profiles does not generate immediate results.

Portfolios (mainly of projects) tend to grow indefinitely, instead of adjusting to capacity. These portfolios reflect the needs of the business, but do not adjust to the reality of what the organisation is able to deliver.

Level of centralisation of strategy decision-making

The organisations we visited still bear a lot of centralisations in decision-making on both the "what" and the "how". The existence of many silos in both the technology and business areas leads to a great fragmentation in the execution of projects, and all these areas are equally responsible for BAU. As a result, it is complex to identify who has the real leadership of the project. Although a project has an assigned budget, it is ultimately broken down into participating areas, but these areas do not function as a multidisciplinary team but rather based on a linear model, which hinders the delivery capacity. The leading area tends to be the one with the greatest budgetary impact, which usually coincides with the technology area.

Involvement in discussions on the prioritisation of the product/service/solution portfolio

Not all key stakeholders are always involved from the beginning, when strategic initiatives are conceptualized. The trend is to operate in a very linear way in terms of the participation of key people, which

leads to continuous rework and a lot of tension between IT, transversal areas and business areas.

Transversal areas do not usually participate in the inception of initiatives. Then, a myriad of problems arises at implementation time that can cause many initiatives to be stopped or refocused.

Organisations with more evolutionary approaches to governance

On the other hand, in those organizations that already had more mature governance implementations, they showed different dynamics fully in line with the findings of (Smeekes et al., 2018). We have grouped the findings into the broad patterns we have identified as shown below:

- 1. *Shifting the focus of the governance model: reduced process control and greater monitoring of the objectives achieved.*

We have observed a shift in focus from projects to product management and/or value stream. This has a big implication on how the technology areas are organised, and in this sense, Agile greatly facilitated the change process.

In general, we observed the widespread use of Objectives and Key Results (OKRs) as a model for setting the strategy and contributing to a greater focus on business results (although in some units we have seen bad practices of OKRs, being used as a contract between IT and business).

An effort has been made to decentralise control mechanisms throughout the organisation, eliminating communicative bureaucracy.

We see that there are working models based on certain principles (autonomy, self-management, communication, and transparency) as an approach to achieving an organisation that is better adapted to the rhythms of the market.

Some organisations have decided to balance people more fluidly between BAU and strategic initiatives.

- 2. *Budget model: Facilitating budgeting by capacity in addition to budgeting by project.*

This is a shift from a project-based budget management approach to a capacity approach but linked to business results. Monitoring is done through events that serve to validate the results achieved. Extensive business case studies are no longer

Table 2 Reference organisations for the characterisation and implementation cycle of the governance model

Case / Sector	Size of the Company	Organisational model	Model of governance	Ways of working in place	Size of persons involved in Adaptative portfolio management
Spain-based international company in the utilities sector	Up to 15.000 employees WordWide	Hierarchical/ centralised. Implementing Agile practices and struggling with a change of mindset	Based on traditional PPM and PMI	- Scrum and Kanban - Waterfall	Up to 250 people directly involved, from the People and Organization Department and from IT Areas and other transversal Areas like legal, procurement and compliance etc..
International Retail Company based in Spain	Up to 100.000 employees Worldwide	Flat hierarchical. Process-focused Agile initiatives. Team topologies based on Spotify model	Based on traditional PPM and PMI	- Scrum and Kanban - Waterfall - ITIL in IT services areas	Up to 500 people directly involved, from the Commercial Areas, IT Departments and other transversal areas like logistics, facilities etc..

necessary, as they do not respond to the speed of market or organisational change.

3. *Greater emphasis on monitoring objectives and not just projects.*

The emphasis is not on monitoring "how they do it", but on "what they do". To this end, the KPIs reveal which initiatives or teams have impediments: problems in the team, risks, blockages, or dependencies that require interventions.

Metrics related to the achievement of results have a different "flavour": speed of value creation, quality of value, capacity assessment (who is working etc.), cost, employee well-being, and impact of dependencies.

4. *Business results orientation*

We have observed how OKRs are a key element for Business Units (BU), teams and/or initiatives. The OKRs approach is not always used, but there is a shift in how to identify the results the organisation wants to achieve and how to get the BUs and technology areas to coordinate to achieve them. This allows them to set clearer prioritisations, on which initiatives/programmes are the highest priority based on expected business outcomes.

4.3 Model Implementation Cycle

4.3.1 Planning

In this cycle of AR, we addressed the design and implementation of an adaptive governance model. In this cycle of our work, we wanted to move away from the extreme cases that we found in the previous cycle. Our goal was to design a more adaptive governance model using a combination of techniques that allow the organisation to manage risks and at the same time to respond quickly to market opportunities. This implies moving away from command & control models, giving more autonomy to the teams, and always considering the constraints of the organisation itself, since for many of them we cannot ignore the

weight of regulatory aspects, business risks, security, technical and architectural debt, etc.

For the design of the first version of the adaptive governance model, we have used the design principles from (Horlach et al., 2019): (a) business value-oriented portfolio management, (b) cross-functional (IT and Business) governance model, (c) creating an environment to give more autonomy to teams with alignment to objectives, (d) short and synchronised portfolio cycles, (e) portfolio alignment with the business strategy, and (f) incorporating innovation in portfolio management.

We have referenced other scholars, such as (Müller et al., 2008), who identified 3 groups of PPM activity: (1) align projects with the business strategy and prioritise them, (2) monitor and continuously communicate project priorities and progress at the portfolio level and (3) make rational and objective decisions to accelerate, delete or reprioritise projects within the portfolio. (2) continuously monitor and communicate project priorities and progress at the portfolio level, and (3) make rational and objective decisions to accelerate, delete or reprioritise projects within the portfolio.

We also used the 4 domains of practice to structure the PPM process proposed by (Stettina & Hörz, 2015): (1) strategize and roadmap, (2) identify and funnel, (3) review, prioritize and balance, and (4) Allocate and delegate.

This resulted in the process shell depicted in figure 2.

We identified a set of roles and responsibilities as programme owner and initiative/project owner. These roles would be dissociated from the positions in the organisation. On the other hand, we created a unit, the Portfolio Board, which would have to report its results to some higher-level unit within the organisation.

Moreover, we have considered the CAS properties identified by (Sweetman & Conboy, 2018): Self-organising, Common purpose, autonomy, adaptability, requisite variety and exchange of

Figure 2. Portfolio Level: Iterative process governance model



resource, as design elements to be considered. Even (Sweetman & Conboy, 2018) proposed approaches to work with resistance to change, such as creating communication environments that foster altruistic attitudes among managers etc... We have also drawn on (Doz, 2020), to consider which workshops or activities can foster the Strategic Agility, which is focused on supporting managers in the mindset shift to a more organic management paradigm.

We are aware that each organisation will have its own speed in incorporating all these design elements. To this end, we set up model configuration workshops to identify which ones to start with.

On the other hand, as mentioned in the initial cycle section, we have considered using OKRs as tools for goal setting and performance management: each portfolio, programme and initiative had to have its own OKRs, which ultimately respond to the objectives of the organisation. For this we created a simple tool to measure the contribution of the initiatives to the OKRs of the portfolio. Monitoring compliance with the KR would have to become a key activity.

Additionally, with a more sociotechnical perspective, we have conducted the first workshops with the organisations involved in our research to identify new design principles that complement those of (Horlach et al., 2019) and that we have incorporated: (a) using OKRs to focus portfolios on business value (b) the backlog of strategic initiatives has to be the trigger to feed continuous conversations between BU's, Technology and transversal areas, (c) encouraging control to be in the hands of the teams, (d) create communication spaces so that the entire organisation is aware of the portfolio of initiatives, (e) have metrics for both progress and impact aligned with the organisation's OKRs, and (f) create a culture of commitment to completion.

With all these elements, we designed a first adaptive governance model to carry out a first implementation cycle in the reference organisations (see Figure 2 and Figure 3).

4.3.2 Action

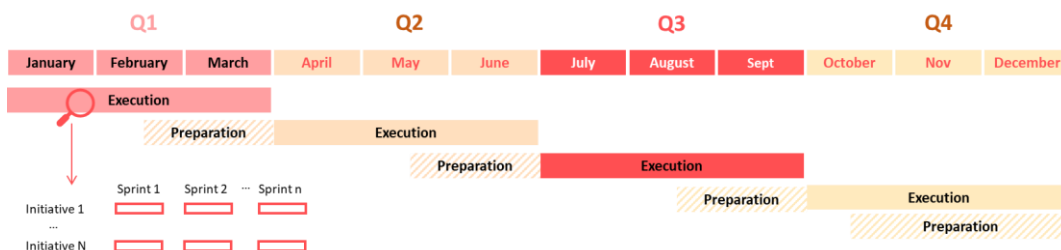
In this first iteration of the model's implementation, we selected the companies' current

strategy as a starting point. For strategic issues, we introduced an approach based on Objectives and Key Results (OKR). We selected a business unit (BU) with a high interrelation with IT. We identified the different portfolios and selected a business portfolio highly connected to technology. The initial reflection was the need for synchronisation between business portfolios and the technology portfolio. In this first action cycle, the process of identifying strategic themes was still annual, and we did not want to change it, as long as the organisational system would not identify this need.

From that point, we started executing the quarterly governance iterations depicted in Figure 2, starting from the business portfolio in synchronisation with the IT portfolio. For these portfolios, workshops were conducted to identify OKRs, and we introduced Design Thinking workshops when the initiatives were customer-centric or creative problem-solving workshops when it came to processes or problems to be solved. The portfolios were divided into programmes, grouped by strategic axes, and we identified which initiatives had to be associated with these portfolios/programmes to start the Quarter (Q) Preparation stage. The following activities were carried out:

- (a) Identify key roles: initiative owners, team members, programme owners and portfolio board. These boards were defined as tools to unblock or remove impediments, and principles for decision-making were identified, encouraging maximum autonomy at the team member level, always considering risk, legal or regulatory aspects.
- (b) Basic homogenization of the initiatives, so that they could identify the impact the initiative would have on the next Quarter, and what deliverables were to be produced. Progress KPIs were also identified.
- (c) Several inception workshops were held, in which all areas (business, transversal areas and IT areas) involved in the initiatives had to participate to identify risks, doubts, or blockages. When finishing the inceptions, the owners of the initiatives had to do everything necessary to eliminate any risks, doubts, or blockages with the

Figure 3 Quarterly iterative model



support of the Program Owners and Portfolio Board.

- (d) For the confirmation stage, a staffing matrix was elaborated to surface multitasking. We created the space to discuss the traceability of OKRs, to map the impact of the initiatives on the portfolio's key results, and to identify the priorities of the initiatives. At the same time, this map collected the contribution of the initiatives to the OKRs, as a tool for discussion and prioritisation. Finally, it was decided which initiatives would be implemented in the next Q. Initiatives with unresolved risks, doubts or blockages were not to enter the quarterly iteration of execution.
- (e) From here, we entered a first quarterly iteration of execution. Synchronisation events would take place around the execution, and we encouraged multidisciplinary teams. If this was not possible, we established two alternative approaches: (i) a synchronisation model between transversal areas, to agree on priorities and to study the impact on the delivery capacity of certain initiatives, or (ii) establishing a capacity booking agreement between areas.

The aim is for this iteration to be repeated every quarter as illustrated in Figure 3. The quarterly timebox is the first reference to check whether ongoing initiatives are being able to deliver value and therefore impact the business outcome, and to validate whether market conditions have changed or not, to pivot on the initiatives.

5. Key findings

At the end of the implementation cycle, we conducted several focus groups and questionnaires with the aim of uncovering the most important insights. The list of insights below is not meant to be exhaustive, but rather to cover those aspects that we consider most important in terms of their impact on contributions.

- One of the main conclusions reached by the Board is that they need focus. Either reduce ongoing initiatives or empower more people, otherwise it will undermine the ability to deliver.
- The BAU versus strategic initiatives dilemma appeared early on. Teams often prioritise BAU, which significantly limits the creation of value and the success of strategic planning.
- Reducing the number of initiatives reduces the complexity of agendas and inefficiency thanks to an increased focus (in this first cycle, delivery capacity was increased by 25% in the first case and 30% in the second one).

- They became aware (including BU) of the relevance of the status of certain technological platforms: the higher the technical and architectural debt, the more complex it is to assemble multidisciplinary teams. They realised their inefficiency.
- The business and IT area concluded that they had to review the strategy and investment in technological architecture to gain agility and be able to scale the business
- Technology silos are strengthened when the budgeting model is project-based rather than investing in value streams. Key conversations were held between Business and IT around investment needs to promote more business-oriented technology.
- The mindset of accounting and justifying people's activity in the projects is still a "thorn in the side". Many managers are embarrassed to show poor delivery, so sometimes it is easier to use the activity as a "smokescreen".
- Although we worked on giving more autonomy to teams, many managers still tended to intervene in team decisions. When this happened, the results were worse.
- Being able to work in multidisciplinary teams, with people from IT, business and transversal areas had a major impact.
- There is still a lot of bureaucracy, and it is difficult for the organisation to think about eliminating it. Many Managers are still reluctant to remove it since bureaucracy is associated with hierarchical power.
- The implementation of the model brought to the surface the difficulty that managers and teams had in taking decisions: it was difficult to assume accountability.
- It is noteworthy the knock-on effect that the implementation of this type of governance model has on the execution of initiatives. It caused the teams to proactively demand a change in the ways of working, from more waterfall practices or lineal models to an incremental iterative approach.
- The model even allowed for organisational liquidity, as the decision to choose board members, owners and participants was not based on hierarchical positions, but rather on the people who would add the most value.
- The focus on value generation and deliverables within the Quarter is having an impact on the management culture, as well as a refocus on placing the customer at the centre.
- The shift in focus, from measuring not just successful execution, but the value delivered, has

brought in discussions that had never happened before, i.e., having a more liquid organisation, or having a software architecture with fewer silos.

All these elements are serving to refine the model and enrich it for the next iterations.

6. Implications of findings

In line with (Puthenpurackal Chakko et al., 2021), we have identified 3 contributions to research and practice in this study, as a response to the research question (stated in section 3.1.)

1.- To have an adaptive portfolio management model (APM) that senses and responds to changes in the market. The governance model is based on quarterly iterations so that the organisation can assess the emergence of new initiatives and thus foster financial and capacity decisions making (Müller et al., 2008). But this is not enough. It is key to develop a Strategic Agility mindset (Doz, 2020) to motivate staff to be very close to the customer (Simon et al., 2021), and thus understand what is changing in the market. (Snowden & Friends, 2021) suggests building an organisation-wide network of human "sensors" to perceive change much more quickly. It is key to create processes that foster distributed experimentation to enable the organisational system to make sense and thrive in complexity (Osterwalder & Euchner, 2019).

2.- Adopting a systemic lens. Undoubtedly (Sweetman & Conboy, 2018) offers us the perspective of seeing portfolio management as a living system, as a CAS, which in turn is connected to other systems. Looking at an APM from the properties of a CAS gives us a really different perspective, it opens us to complexity thinking (Snowden & Boone, 2007) and therefore on the non-linearity in the relationships between systems to achieve the key objectives and outcomes of a portfolio.

3.- The socio-technical approach highlights the connection between the APM and the rest of the organisation's systems. It has been key for our proposal to identify the connection between the Governance Model and the Enterprise Architecture (Gellweiler & Otto, 2020), (Horlach et al., 2019). There is a connection between the organisation's strategy, operating models, technology architecture strategies, organisational design, and culture with the governance model. This implies that having an adaptive governance model can allow us to adjust the rest of the elements to facilitate the execution of the business strategy and to achieve greater business agility. We appreciate that we cannot assess a governance model as an isolated entity but must do so in the light of its interrelationship with other systems.

In such a case, we can understand the impact it is having on the organisation to be more adaptive.

Limitations of this study

This study has two important limitations: (1) In the part of the semi-structured interviews, we had access to a small number of companies, up to 6. (2) The AR is still immature in its application and requires more cycles of change. Moreover, its application was carried out in two organisations, so we cannot generalise conclusions.

7. Conclusions and future work

The opportunity to conduct AR-type research in two organisations allowed us to identify patterns that were repeated although there were exceptions derived from cultural or business aspects. This allowed us to identify important operational improvements in the model, as well as new research possibilities:

- Identify business and technology value streams to evolve towards a product approach.
- Shift the budgeting approach to a value stream approach rather than a project approach. While not discontinuing the annual approach, making it lighter by introducing quarterly reviews. The Lean Budgeting approach is being assessed very early on.
- During this first cycle, the automation of the governance model was implemented in Office tools. A further improvement will be to automate all these elements to eliminate the manual component and consider a JIRA-type tool.
- Although more autonomy is being granted to teams in both operations and control, there is still a need to continue with this approach, as the middle management culture is still struggling with a different approach than Command and Control.
- In the following cycles, more metrics need to be incorporated to connect execution with business results. On the end-to-end development side, it is necessary to measure flow velocity flow efficiency, flow times and flow load (without neglecting other proxy metrics that will allow us to identify bottlenecks). In turn, it is necessary to connect these execution metrics with business metrics (value, cost of execution, quality, and happiness).
- The implementation of OKRs has not been straightforward, although it has had a very positive impact. In the absence of empirical evidence and academic literature, an analysis of the use of OKRs in organisations could be a line of research.

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