inter·noise 2021
1–5 August | Washington, DC

A strategic approach to noise action planning?

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ABSTRACT

Airports are required to manage noise impact owing to a requirement for them to obtain a social license to operate from the public, and to comply with legislation such as the ICAO Balanced Approach and Environmental Noise Directive. The latter requires the development of noise action plans to help direct noise management strategies over long-term periods, however their success in this regard has been called into question. On the basis that noise is, at its core, a business challenge like any other, this paper investigates approaches and frameworks to strategic planning and decision making from the strategy and business literature, to identify core aspects that may be of value to the action planning process. In so doing the paper identifies several opportunities for noise action planning, and subsequent noise management measures, to be enhanced, and calls for additional research to further explore the potential for such approaches to be developed and applied in the future.

1. INTRODUCTION

There is an increasing body of research, guidance and policy that exists to support the management of airport noise and resulting impacts borne by noise exposed airport communities. Policy in particular has played an important role in shaping noise management, illustrated for example in the European Union via the ICAO Balanced Approach [1] and Environmental Noise Directive [2]. The latter requires that airports of over 50,000 annual aircraft movements conduct comprehensive monitoring of noise, disseminate the results of such monitoring, including via noise contour maps, and to produce noise action plans. These action plans aim to provide broad long-term guidance in relation to noise by helping to 'manage noise issues and effects, including noise reduction if necessary' [2, p. 14]. Action plans are required to be reviewed when a major development occurs that may affect the existing noise situation, or at five yearly intervals, which Murphy and King [3, p. 292] suggest is evidence that the Directive is process-orientated 'in the sense that it is continuous and evolving and regularly takes account of major changes that are likely to affect the soundscape of the area under consideration'. Although their specific content is not strictly provided for, their aim is to take noise data, and in the context of wider noise policy (i.e. national legislation and the ICAO Balanced Approach) set out long term plans and commitments to the management and reduction of noise at airports. In this context, noise action plans could be viewed as strategic management documents, similar to the types of Corporate Social Responsibility documentation produced by organisations (including airports) who have a remit to tackle broader environmental and societal issues such as climate change, and which set out objectives, progress, targets and pathways to solving such challenges.

Noise action plans should then be valuable tools in managing noise by providing long term strategies regarding its abatement. However, despite their provision, complaints at airports have generally continued to rise, despite reductions in sound levels from individual aircraft. The reasons for this are

complex, but it is likely that noise action plans are certainly limited in their capacity to influence noise impact due to the fact that no overarching common approach to their creation of across European Member States exists, meaning that they can differ significantly in their comprehensiveness, the innovativeness and ambition of their described abatement measures, and varying levels of long-term and short-term thinking. Moreover, stakeholder interviews conducted in the H2020 ANIMA project highlighted that there is a perception that noise action plans are often compiled as a result to a legal requirement to do so, rather than as useful management tool with which to develop effective noise management strategies, whilst those who develop such action plans may often find that their implementation suffers due to a lack of control and hierarchical decision making, which can sit at the national policy level [4].

2. NOISE AS A STRATEGIC MANAGEMENT CHALLENGE

Noise and noise management are incredibly complex. They involve a range of stakeholders with vested interests that need to be understood [5]. They require the collection and analysis of a wide range of data, much of which is incomprehensible to community stakeholders [6]. They result in a wide range of well documented health outcomes, but in which there remains many unknowns [7]. Meanwhile, the specific characteristics of each airport means that there is no best practice solution to managing noise - what works at one airport may not be implementable at another and if it can be, the results may differ considerably [4], [8].

However, despite these complexities, in its purest sense noise is a strategic and operational challenge like any other. It is an unwanted externality arising from organisational activity, that has negative impacts on a range of stakeholders. Noise therefore requires management in order for airports to obtain a social license to operate from the public who are impacted by noise, and to comply with national and international legislation that exists to serve the same people. One could go as far as arguing that at its core, noise management is simply a process of organisational problem solving, albeit a rather complex example.

The business literature has a great deal of theory and expertise regarding how to solve such problems at the strategic level. Indeed, one could posit that problem solving is one of the core requirements of any organisation with aspirations of being successful over long time periods. One in stasis cannot expect to remain relevant, efficient, or fit for purpose in a world of rapidly evolving political, economic, societal, technological, legislative and environmental contexts without adapting and innovating in response to such disruptive forces. This is at the core of innovation research and practice. The implication here is that if noise management is an organisational challenge that needs managing, or a problem that needs solving, then there is likely to be value in investigating the processes, tools and frameworks used in wider business contexts to accomplish those same goals. At Internoise 2020 [9], and subsequently through publication [10], I have made the case for design thinking to inform on the development of individual noise management measures at airports. In this paper I draw upon the strategic management literature to highlight key aspects that can help inform the development of noise management strategies at airports in the future, in particular the development and implementation of noise action plans and overarching noise strategies. It is not intended to present or act as a rigorous step framework that airports should follow, rather, the presented work outlines some key characteristics that airports should consider when conducting noise management action planning, and introduces some of the core concepts that should be considered at each phase. In this sense, this paper should be viewed as the beginning of a dialogue around taking more strategic approaches to noise management, including the appropriateness of such approaches, what strategic frameworks for noise might look like, how strategy can be converted into specific noise measures, and how processes of stakeholder engagement and consultation can be embedded in to this process.

3. WHAT IS STRATEGY?

The world is a rapidly changing place and a range of things can affect the relative success of any organisation. New challenges arise. Political pressure comes and goes. Competitors appear and disappear. New technologies offer opportunities – and threats. Strategy exists to help organisations understand their place in this changing world by providing direction and to organisational activity over long-term periods. It does this by configuring resources in such a way as to fulfil stakeholder expectations, and to arrive at some aspired final destination [11]. In so doing, strategy helps to inform decision making by [11]:

- Providing direction to an organisation's activities (i.e. the development of an overarching approach to noise management that is consistent with wider organizational objectives).
- Matching those activities to the world the organisation exists in (i.e. by considering external factors such as industry growth, new aircraft technologies, or research findings regarding health).
- Ensuring that the organization has the necessary capacity and capability to support the chosen direction (i.e. building the appropriate skills of the management team in collecting and analysing data or engaging with community residents).
- Understanding and consider the values and expectations of stakeholders (i.e. acknowledges the role of non-acoustic factors in the perceived success of operational changes).
- Providing pathways of implementation of change (i.e. ensures that barriers are identified, overcome, and that progress can advance over time).

As illustrated in, Figure 1 Strategies exist at different levels across an organisation, from corporate strategy down to strategy at the operational or process level. Each level concerns different types of decision making, ranging from the long-term direction of an organisation, to its the day-to-day management, however the operational characteristics of a firm should be working towards helping the organisation deliver on its wider goals and objectives, hence why things such as 'Visions' and 'Mission Statements' are popular at the strategic level. They not only help to ensure buy-in to that message from employees, shareholders and stakeholders, but they help to ensure that everything that the organisation is doing is compliant with that vision. If they are not, then they broadly speaking should not be taking place.

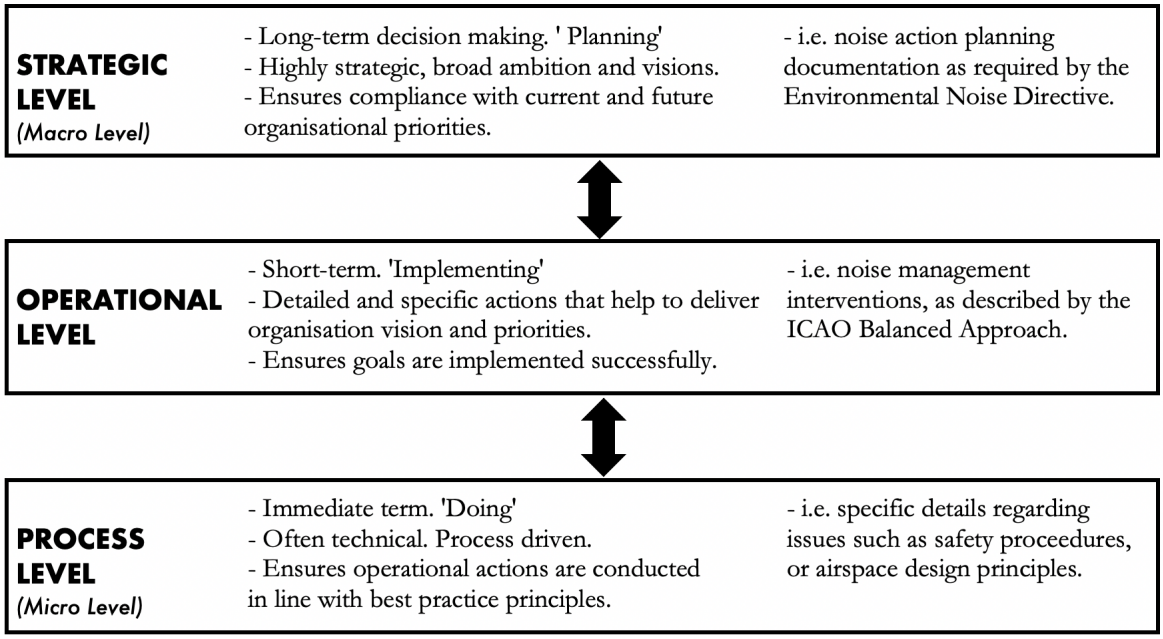

Figure 1: Strategic, Operational, and process level activities of an organisation (Authors own).

The importance of strategic thinking is also illustrated through the concept of human-centric design, which outlines that to be successful, activities undertaken by organisations must be viable, feasible and desirable. For noise this means (Figure 2)**:**

- *Viable* in terms of complex factors such as safety, security, environmental interdependencies and legislative compliance;
- *Feasible* in terms of airport infrastructure and financial capabilities; and
- *Desirable* to industry and community stakeholders.

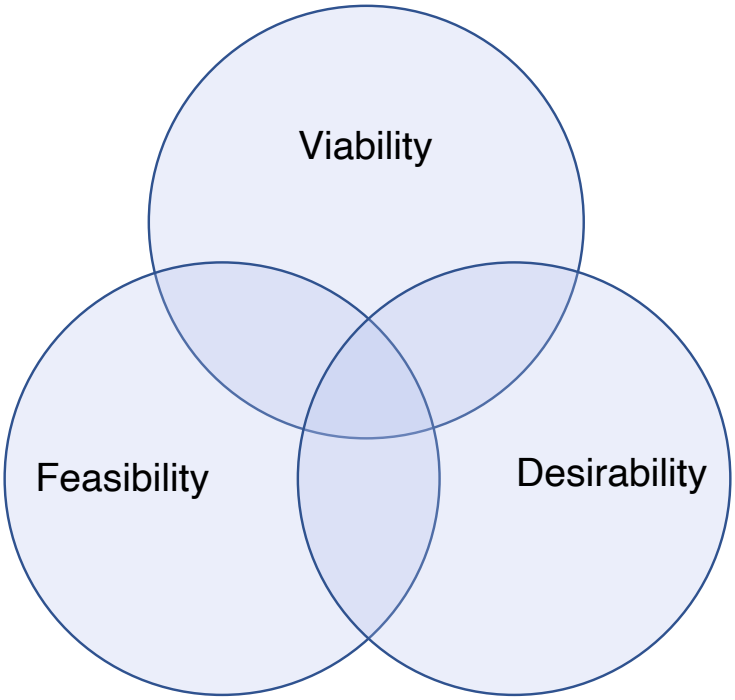

Figure 2: Core concepts of human-centered design (Adapted from [12].

Proper strategic planning processes can help for such factors to be embedded into practice by providing a space and a home in which such thinking surrounding each factor can take place; the result being the creation of a strategy that can take airports towards noise management actions and interventions that are not only technically viable and feasible, but that also desirable to themselves and to their many stakeholders, thus enhancing their perceived acceptability and success. Such processes can also aid airports by providing robust, repeatable, evidencable and evaluable processes based on targeted outcomes and impact.

4. PROCESSES AND FRAMEWORKS FOR STRATEGIC NOISE ACTION PLANNING

There has been much academic enquiry into the development of effective strategies to solve business challenges. Historically these have arisen from the business schools, however in recent years strategic thinking has also risen to the forefront of environmental management research. What is common across all of these approaches as the use of an iterative process of different activities and thinking that take place in a specific order which can guide an organisation from a series of unknowns and broad objectives, towards specific management interventions and implementation pathways.

Figure 3 illustrates such process and frameworks by introducing three methodologies for strategic problem solving with regard to environmental issues, an approach proposed for the design of individual noise management measures (as opposed to overarching strategic approaches), and a more generic process for organisational problem solving derived from the design community:

- Framework for Strategic Sustainable Development (FSSD) [13]; a framework that sets out to guide organisations in the development of strategies for sustainable development utilising a range of approaches including vision setting and backcasting.

- Comprehensive Strategic Analysis for Sustainability [14]; A framework for strategic sustainability analysis, initially developed by [15] for more generic implementation as a strategic development tool from the business schools. Both approaches are focused around three primary phases – understanding the initial situation an organisation finds itself, analysing that information to create a call to action for change, and developing innovative solutions, implemented through strategy.
- The Backcasting and Eco-Design Framework [16]; A framework for the development of approaches to circular economy innovation of products and services based on the concepts of backcasting [17] and eco-design [18].
- The ANIMA Methodology [8]; A suggested methodology for the development of noise management interventions, conducted as part of the ANIMA research project and developed through analysis of a range of case studies conducted with airports and wider ANIMA findings. Although not created for application at the strategic level, or based on the strategy literature, it is a useful lens into existing problem-solving approaches at airports, seeing as it was created from an analysis of several airport case studies.
- Design Thinking [19]; a popular approach taken in the development of products and services, that has been used in strategic management contexts, and that is increasingly advocated in the academic literature for application to solve a range of environmental challenges. The concept creates a series of spaces in which different types of activities can take place [20], [21], notably need-seeking, brainstorming, and prototyping [22], or as [23] defines them: inspiration, ideation and implementation. The process also places a strong focus on collaboration and addressing the needs of end-users. Design thinking has previously been proposed by [10] as a potential approach to noise management. Similar approaches have been taken by the UK Civil Aviation Authority [24] and the United States Federal Aviation Authority [25].

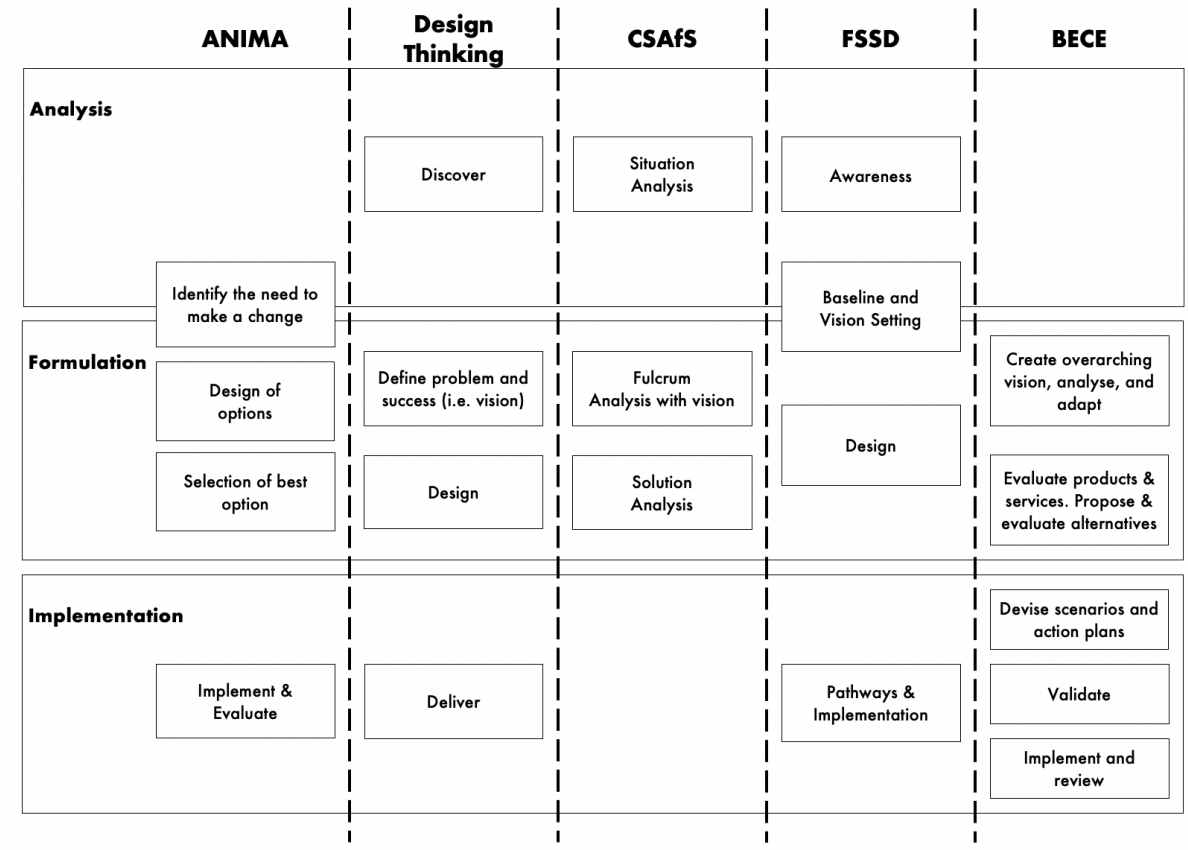

Figure 3: Illustrating a range of approaches to problem solving at the strategic and process level relevant to noise management.

The figure helps to illustrate a number of similarities across these examples that may help to inform on the characteristics that may be beneficial for an approach to strategic noise action planning.

- ***Overarching, aspirational visions***: visioning of successful outcomes appears to be important in creating aspired end points of success. This is important because it can help to mobilise action across an organisation and its stakeholders, and it can provide an end point against which the success of the strategy and individual actions can be evaluated and disseminated. Broad success visioning can also help to identify design principles that can help to guide the implementation of the vision, as anything that doesn't fit with, or contribute to the vision should be avoided. Performing vision mapping early in the process is often advocated as a way to ensure that visioning is free from barriers and constraints, however there is often scope for such visioning to be adapted at a later date. Best practice in terms of communication and engagement suggests that such visioning should be co-created by a multi stakeholder team. When co-created, such visioning can help to obtain buy in to any work that takes place.
- ***Evaluation***; The reviewed frameworks tended to have embedded processes of evaluation so that success can be evaluated and demonstrated to stakeholders, and used to refine and improve practice over time. This is linked to the aforementioned need for vision setting. Such vision setting helps to develop broad ideas of what success looks like, and can help to ensure that evaluation is considered from the onset and throughout a noise management intervention, for instance in the clarification of aims and objectives, the selection of indicators, the linking of outcomes to indicators and methods, and establishing data-collection processes. Considering evaluation throughout noise management strategy is also important considering that evaluation may occur at multiple points: Front-End Evaluation, in which research into the needs of stakeholders takes place to understand things like what their needs, perceptions and fears and so on are taken into account; Formative Evaluation, which takes place as part of the testing, trialling and refinement of management measures; and Summative Evaluation, which happens during or after the measure has been agreed and is/has been implemented.
- ***Iterative and typically following a design-led approach***; Reviewed frameworks are by their nature iterative, and empower users to move from a current situation to some aspirational future outcome, via individual actions, or a pathway of multiple interventions. They also demonstrate opportunities for refinement, or restating and repositioning of problems to be faced as baseline data is collected, analysed and incorporated into decision making. This is important as it ensures that any baseline data or evaluation that takes place is actually incorporated into decision making processes and not ignored. Through the use of iterative processes, it is not only easier to develop strategies by building on ever deeper levels of understanding, it is also easier to embed concepts of engagement and consultation, and importantly provides a mechanism through which the rationale behind derived strategies can be communicated to stakeholders, as well as the strategy itself.
- ***Collection of baseline data***; Frameworks acknowledge the importance of basing practice on data, including qualitative data, to help ensure that the situation, or starting point that firms currently find themselves, in is well understood and defined. Doing so can help to further define success and implementation principles and provide an evidence base on which success and impact can be evaluated. Data collection in this phase includes summarising the world in which firms currently exist, by considering externalities such as political, economic, societal, technological, legislative and environmental factors. This sort of analysis (often referred to as PESTLE analysis) can help to ensure that strategies are likely to be robust into the long-term future by spotting opportunities that can be leveraged, and barriers that may need to be overcome. This can lead to innovative thinking by stimulating enquiry and collaboration with others, for example it could lead to the development of research collaborations to take advantage of emergent and disruptive technologies and how they might be implemented.
- ***Including a qualitative and 'End-Use'r focus***; all of the approaches acknowledge that for a product or service to be perceived as successful, it is important that the views of the benefices are taken into account. This means collecting qualitative data as well as quantitative data,

which although challenging to acquire can be incredibly powerful. Although one would be correct in suggesting that residents are certainly not the customers of noise management teams, it is clear that without residents living near to airports noise management teams would not exist, or at least would look quite different, and as the primary beneficiaries of noise abatement measures, and those with the power to complain and campaign, establishing empathy for such stakeholders should be an essential part of noise management strategy.

- ***Motivating action***; In the case of FSSD, the collection of data can be extended to an awareness building phase in which the focal firm goes through a period of learning about sustainability challenges to help motivate action. CSAfS takes a similar approach through its Fulcrum Analysis phase, where analysis of internal and external factors in situation analysis is presented to company decision makers so that a 'call to action' can be co-created with the organisation to drive the Solution Analysis phase, and a commitment to its implementation. In both cases, the activities described are powerful in helping organisations acknowledge the requirements for action, and to be better able to describe these changes to internal management, stakeholders, shareholders or other interested parties.
- ***Focus on implementation (i.e. including pathways)***; A common critique of framework approaches to environmental management issues is a focus on solutions, but a failure to drive implementation [16]. Many of the frameworks reviewed however attempt to bridge this challenge by developing implementation pathways that can move organisations from their current state to the aspired future vision. This can include, for example, identifying the need for teams to be mobilised, stakeholders that may need to be engaged with, or legislative challenges that may need to be overcome. Several of the frameworks advocate the use of backcasting, a method that develops future scenarios based on an aspired future vision, that can be assessed for their implications and feasibility [26]. In so doing barriers can be identified and pathways to overcoming them identified, doing so until one has travelled from the aspired future vision, back to present state, from which an action plan is typically co-created with stakeholders. Hence, backcasting is used in complex settings with many stakeholders, where there is a desired future vision, but little clarity on how to reach it.
- ***Co-creation and embedded multi-stakeholder considerations***; Most of the frameworks advocate the use of multi-stakeholder teams to ensure that all who may impact or be impacted by the strategy have a voice and the opportunity to input into that strategy. Doing so helps to ensure success by minimising the opportunity for unknown issues to arise, as well as ensuring buy-in to the strategy by bringing people into the decision-making process.

5. A FRAMEWORK FOR STRATEGIC NOISE ACTION PLANNING?

The aim of this exploratory paper was to look at some examples of frameworks for strategic management, so that key factors could be extracted that could help to inform on what such a framework for noise management might look like.

It is clear that such frameworks share a great deal of similarities in their content, even if the exact timing of their application differs from a case-by-case basis. The similarity of the content, and the broad flow of activities from visioning and discovery to ideation and implementation, underpinned by evaluation and engagement suggests that a similar approach could have value to those charged with the task of developing noise action plans. This may particularly be the case for small but rapidly growing airports or competent authorities who are required to write noise action plans for the first time. A key tenet of noise management is that best practice should be determined on a case basis, however it seems reasonable to suggest that a framework to help airports develop their own solutions to noise management may be beneficial in helping them to develop and implement their own bespoke solutions to the unique challenges that they face. It is also clear that further research is required to take place in this are to identify what a framework for the development of strategic noise action plans might look like, and to answer questions such as:

- Are the aforementioned attributes found in other frameworks applicable in a noise action planning context?
- How should such processes be configured into a robust, repeatable, yet flexible process?
- Are such attributes better implemented as a toolbox from which relevant aspects can be selected as appropriate, or would this lead to more difficult elements being ignored?
- What processes have existing noise action plans gone through in their development? Do such processes offer insight into what might work and might not be appropriate?
- How well does a framework for noise action planning hold in case study application?

Importantly, it is important that any such framework lead by example, and follow processes of co-creation with those it aims to serve (airports and their stakeholders), to determine what it, and its application, might look like. Doing so could offer airport communities significant assuredness in noise action planning processes.

6. ACKNOWLEDGEMENTS

This work reflects the perspectives of the researcher based on their expertise in noise management, and their experience in working in environmental management, strategy, and innovation fields. The author acknowledges the contribution of EU project ANIMA (Grant agreement ID: 769627) to the initiation of some the ideas presented here; but their development has been conducted independently. The author is solely responsible for the content presented, and the opinions expressed.

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