

Balancing Organizational Needs and Career Sustainability: A Long-Term Workforce Planning Perspective in the Portuguese Navy

Margarida Sousa, Ivo Soares, Inês Coelho and Rui Deus

CINAV – Portuguese Naval Academy

DOI: <https://doi.org/10.47772/IJRISS.2026.100800333>

Received: 27 August 2026; Accepted: 01 September 2026; Published: 04 September 2026

ABSTRACT

Long-term workforce planning is particularly challenging in hierarchical organizations, where personnel structures simultaneously determine organizational staffing capacity and the conditions under which careers develop. This study examines how workforce planning can contribute to balancing organizational requirements and career sustainability in a military context. For this purpose, a weighted goal-programming framework is applied to derive a Reference Special Personnel Table (RSPT) for the officer category of the Portuguese Navy. The model integrates three dimensions: operational staffing requirements, career-profile targets, and sea–shore rotation, subject to legally established personnel ceilings. The resulting reference structure is compared with the 2025 Special Personnel Table to identify structural differences and trade-offs across ranks and specializations. Results show that substantial changes in the distribution of positions can occur even when the overall personnel ceiling remains broadly stable, revealing imbalances that are not captured by aggregate workforce size alone. From a human resources perspective, these findings highlight the importance of considering organizational structures as part of the conditions shaping career development and progression in hierarchical organizations. The study contributes to the workforce planning and career development literature by positioning long-term workforce planning as a strategic mechanism for aligning organizational requirements with sustainable career structures.

Keywords: strategic workforce planning; career sustainability; career development; career structures; military human resources; Portuguese Navy; workforce planning; goal programming

INTRODUCTION

Workforce planning is a central component of strategic human resource management because it seeks to align an organization's human resources with its current and future organizational requirements. Traditionally, workforce planning has been concerned with ensuring that organizations have the appropriate number of employees, with the appropriate skills, in the appropriate places and at the appropriate time (Sinclair, 2004). More recent approaches increasingly emphasize the strategic role of workforce planning in supporting organizational resilience and adapting human resource capabilities to changing organizational environments (Georgescu et al., 2024). This perspective suggests that workforce planning should not be understood solely as a process of determining how many employees an organization requires, but also as a mechanism through which the organization structures future workforce capabilities and career opportunities.

The career dimension becomes particularly important in organizations characterized by hierarchical and highly structured career systems. In such contexts, workforce structures can directly influence the progression opportunities available to employees because advancement may depend on the availability of positions at higher organizational levels. This relationship is particularly pronounced in military organizations, where personnel generally enter at the lower levels of a career structure and progress sequentially through established ranks and specializations (Abreu, 2023). Consequently, workforce decisions concerning the distribution of positions across ranks and specializations have implications that extend beyond immediate staffing requirements: they also influence the conditions under which individual careers develop over time.

From this perspective, long-term workforce planning can be understood as having both an organizational and a career function. At the organizational level, it seeks to ensure that sufficient personnel are available to fulfil operational requirements. At the individual level, however, the structure of available positions can shape career progression, the time personnel spend at different organizational levels, and the opportunities available for advancement. In hierarchical organizations, these two dimensions are intrinsically connected because the personnel structure that satisfies organizational requirements is also the structure through which careers progress. Workforce planning therefore represents not only a mechanism for allocating human resources, but also an important component of the organizational architecture within which careers develop.

Military organizations provide a particularly relevant context for examining this relationship. Unlike many civilian organizations, where vacancies at intermediate or senior levels can be filled through external recruitment, military organizations generally depend on internal progression to populate higher ranks. The retention and progression of personnel therefore affect not only individual careers but also the organization's future capacity to fill positions throughout the hierarchy (Abreu, 2023). Previous research has consequently examined workforce planning in military organizations from perspectives including recruitment, promotion, personnel allocation, career-path design, and transition planning (Horn et al., 2016; Mazari-Abdessameud et al., 2020; Santos et al., 2021; Škraba et al., 2007). Much of this literature, however, approaches career progression primarily as a variable within the workforce-planning problem rather than examining the personnel structure itself as a mechanism that shapes the sustainability of career trajectories.

This distinction is particularly relevant when workforce requirements and career expectations do not point towards the same personnel structure. A position structure may be sufficient to meet operational requirements while simultaneously generating longer or shorter-than-targeted periods at specific ranks or limiting progression opportunities in specific specializations. Conversely, a structure designed primarily to support career progression may not provide sufficient personnel in the positions required for organizational operations. The resulting tension highlights the need to consider workforce planning as a long-term process in which organizational capacity and career development are jointly considered rather than treated as independent concerns.

The Portuguese Navy provides a particularly relevant empirical setting for examining this issue. Its workforce structure is governed by statutory personnel ceilings and organized according to ranks and specializations. Within this structure, the Special Personnel Table (SPT) defines the authorized distribution of positions across ranks and specializations, thereby shaping the opportunities for promotion within each career path. The SPT therefore has a dual function: it supports the allocation of personnel to organizational requirements while simultaneously influencing the progression opportunities available throughout military careers. Existing research on the Portuguese Navy has highlighted challenges related to personnel retention and career progression (Neves, 2023), while recent changes in the country's defence environment and naval capabilities further increase the importance of effective long-term workforce planning (Governo da República Portuguesa, 2025).

Despite this relevance, the annual definition of personnel structures is predominantly oriented towards immediate workforce requirements and the vacancies expected to arise. Such an approach provides limited support for assessing whether the resulting structure remains appropriate as a long-term career architecture. In particular, it does not readily reveal how alternative personnel structures may affect the distribution of career opportunities across ranks and specializations, nor whether deviations from desired career profiles arise from insufficient personnel capacity or from structural tensions between organizational and career objectives. This creates a need for workforce-planning approaches capable of examining personnel structures from a longer-term career perspective.

Against this background, this study examines long-term workforce planning as a mechanism for aligning organizational staffing requirements with sustainable career structures. Using the Portuguese Navy as a case study, the study analyses how alternative personnel structures affect staffing adequacy, career profiles, and the distribution of assignments between sea and shore. A quantitative decision-support model is used to generate a reference personnel structure, but the focus of the analysis is on its implications for career planning and workforce management rather than on the mathematical formulation itself.

The study addresses the following research questions:

RQ1. How can long-term workforce planning contribute to the alignment between organizational staffing requirements and military career structures?

RQ2. What trade-offs emerge between organizational workforce requirements and career progression when designing a long-term personnel structure?

RQ3. What are the implications of alternative personnel structures for career planning and human resource management in hierarchical organizations?

By addressing these questions, the study contributes to the human resource management literature by conceptualizing long-term workforce planning not only as a mechanism for ensuring organizational staffing capacity, but also as a mechanism that shapes the architecture and sustainability of career trajectories. The Portuguese Navy case illustrates how these two functions can come into tension and how quantitative workforce planning can be used to make such tensions visible to HR decision-makers.

THEORETICAL BACKGROUND

Strategic Workforce Planning

Workforce planning has traditionally been concerned with determining the number of employees and skills required to meet an organization's future needs, ensuring the appropriate number of people, with the appropriate skills, in the appropriate places and at the appropriate time (Sinclair, 2004). It has progressively evolved towards a more strategic and forward-looking process in which workforce requirements are considered in relation to organizational objectives and future operational conditions (Georgescu et al., 2024). Recruitment, attrition, promotion, training, retention, and personnel allocation are interconnected processes that jointly determine the composition and capabilities of an organization's future workforce. A recent review of workforce-planning methodologies highlights the diversity of analytical, simulation, and empirical approaches developed to address these interdependencies (Peck, 2025). Workforce planning should therefore be understood not simply as a headcount exercise, but as a dynamic process through which organizations anticipate and shape their future workforce configuration.

The increasing complexity and uncertainty surrounding organizational environments have further strengthened the strategic role of workforce planning within human resource management. Contemporary approaches increasingly emphasize the use of data, forecasting, and analytical decision-support mechanisms to anticipate workforce requirements and evaluate alternative responses (Bositkhanova & Dadaboyev, 2025). Rather than responding exclusively to existing vacancies or short-term staffing shortages, strategic workforce planning seeks to anticipate future workforce needs and align human resource capabilities with the organization's longer-term strategic direction. This proactive orientation is particularly important when workforce decisions involve long lead times or when current personnel structures constrain the organization's future capacity to recruit, develop, or promote employees.

Quantitative approaches can play an important role in this process because workforce planning frequently involves multiple objectives and constraints that cannot be considered independently. Workforce requirements may need to be reconciled with limitations on personnel numbers, skills, costs, availability, promotion flows, or other organizational conditions. Recent methodological research illustrates the continued relevance of analytical and optimization-based approaches for addressing such interdependencies and for evaluating alternative workforce configurations (Peck, 2025). More recent decision-support approaches have also sought to integrate multiple organizational objectives and uncertainty into workforce-planning decisions (Huq, 2026). In this context, quantitative models should not be understood as replacing managerial judgement, but rather as providing decision-makers with structured evidence about the consequences and trade-offs associated with alternative workforce strategies.

From a human resource management perspective, however, the strategic value of workforce planning extends beyond ensuring organizational capacity. Workforce decisions also determine how employees are recruited, retained, developed, promoted, and allocated over time. Consequently, the structure produced by workforce planning can influence the opportunities available to employees and the trajectories through which they progress within an organization. This dimension becomes particularly relevant in organizations where career progression is strongly dependent on the availability and distribution of positions across hierarchical levels.

Accordingly, long-term workforce planning can be understood as both an organizational planning process and a mechanism that establishes the structural conditions for future careers. The distinction is important because an organizationally adequate workforce structure may not necessarily provide equivalent or sustainable progression opportunities across different occupational groups or hierarchical levels. Understanding this relationship requires consideration of the organizational contexts in which workforce planning takes place, particularly in hierarchical organizations where recruitment, promotion, and career progression are closely interconnected. The following section therefore examines the specific relationship between workforce planning and career structures in hierarchical organizations.

Workforce Planning in Hierarchical Organizations

The relationship between workforce planning and career development becomes particularly important in hierarchical organizations, where organizational positions are distributed across successive levels of authority and progression between these levels is subject to formal rules and structural constraints. In such organizations, workforce planning cannot be reduced to determining the overall number of employees required. The distribution of positions across hierarchical levels, occupational groups, and career stages determines, to a significant extent, how personnel can enter, progress, and remain within the organization. Workforce planning therefore has implications not only for organizational capacity but also for the structure of employees' career trajectories.

Military organizations represent a particularly structured form of hierarchical organization. Their personnel systems are generally characterized by formal ranks, occupational specializations, defined career paths, and regulated mechanisms of recruitment and promotion. Unlike organizations in which vacancies at intermediate or senior levels can frequently be filled through external recruitment, military organizations typically rely substantially on internal progression to populate higher ranks. This creates a strong interdependence between the number and distribution of positions at different ranks and the progression opportunities available to personnel entering the organization at lower levels. As a result, decisions concerning the workforce structure at one hierarchical level may have consequences for personnel flows and career progression at subsequent levels.

This structural interdependence has been recognized in the military manpower-planning literature. Mazari-Abdessameud et al. (2020), for example, characterize the hierarchical structure of military organizations as a factor that restricts personnel movements and recruitment and propose a career-path approach to integrate workforce requirements with career advancement. Their model simultaneously considers the need to maintain appropriate distributions of personnel characteristics across ranks and ages and the need to ensure adequate personnel allocation throughout the planning horizon. Similarly, Horn et al. (2016) examined recruitment and promotion rates within the Australian Defence Force, illustrating how workforce planning decisions concerning entry and progression are interconnected over time. These studies demonstrate that military workforce planning necessarily involves both an organizational dimension, concerned with fulfilling workforce requirements, and a career dimension, concerned with maintaining viable flows of personnel through the hierarchy.

The career implications of hierarchical workforce structures arise because progression is dependent on the availability of positions at successive levels. When the number of positions at a higher rank is limited, personnel may remain longer at their current rank even when they satisfy the requirements for progression. Conversely, an increase in positions at higher levels may accelerate progression and create vacancies that affect personnel flows throughout lower levels of the hierarchy. The structure of positions therefore operates as a form of organizational constraint on career movement. This does not imply that workforce structure is the only determinant of career progression, since promotion may also depend on factors such as individual

performance, qualifications, seniority, organizational needs, and statutory requirements. Nevertheless, the availability and distribution of positions establish an important structural boundary within which these mechanisms operate.

This characteristic distinguishes hierarchical workforce planning from workforce planning in more flexible organizational structures. In organizations with greater possibilities for lateral mobility, external recruitment, or relatively fluid job structures, shortages at one hierarchical level may be addressed through alternative staffing mechanisms. In contrast, when progression is predominantly internal and sequential, workforce imbalances may propagate through the hierarchy. A shortage of positions at one level may constrain progression into that level, while an excess of positions at another level may generate corresponding staffing requirements below it. Workforce planning must therefore consider the workforce as an interconnected structure rather than as a set of independent staffing categories.

The implications extend beyond military manpower planning itself. When the organizational structure determines the availability of progression opportunities, workforce planning becomes relevant to career management because it establishes part of the context within which individual careers develop. From this perspective, a personnel structure may be operationally adequate while simultaneously creating uneven progression conditions across ranks or specializations. Conversely, a structure designed to facilitate career progression may generate staffing configurations that do not adequately respond to organizational requirements. The resulting tension between organizational capacity and career progression provides an important rationale for examining workforce planning from a broader human resource management perspective.

This perspective is particularly relevant to long-term planning. Short-term workforce decisions may respond adequately to immediate vacancies without revealing the cumulative effects of the resulting structure on future career progression. A long-term perspective makes these effects more visible by considering how personnel move through the hierarchy over time and how the distribution of positions at different levels affects subsequent career opportunities. Workforce planning in hierarchical organizations should therefore consider not only whether the organization has sufficient personnel at a given point in time, but also whether its personnel structure can support both future organizational requirements and viable career trajectories.

Career Development and Career Sustainability

Career development encompasses the processes through which individuals develop, manage, and progress through their careers over time, but these processes do not occur independently of the organizational context in which careers unfold. Organizational structures, human resource practices, opportunities for development, mobility mechanisms, and promotion systems can influence the opportunities available to individuals and the trajectories they can pursue. Career development should therefore be understood as an interaction between individual agency and the organizational conditions that shape the range of possible career paths.

This contextual dimension is particularly relevant to the concept of career sustainability. De Vos et al. (2019) conceptualize sustainable careers as dynamic and systemic processes that develop over time and across multiple contexts, identifying person, context, and time as interrelated dimensions and happiness, health, and productivity as relevant outcomes. This perspective highlights that career sustainability cannot be considered exclusively from the perspective of individual characteristics or choices, since organizational contexts are also consequential. The temporal dimension is particularly relevant in hierarchical organizations because careers unfold through successive stages, and delays or constraints at one level may affect subsequent opportunities. Van der Heijden et al. (2020) similarly emphasize the importance of examining sustainable careers across the lifespan and their interaction with different life domains.

The organizational context also plays an important role in shaping career sustainability. Tordera et al. (2020) examined the relationship between organizational HR practices and sustainable career patterns and found that HR practices and age jointly influence patterns of employee well-being and performance. Their findings support a contingency perspective in which the organizational practices surrounding employees' careers can contribute differently to career sustainability depending on individual and temporal characteristics. This

suggests that career sustainability should not be considered exclusively as an individual responsibility, but also as an outcome influenced by organizational systems and practices.

In hierarchical organizations, career management systems represent an important component of this organizational context. Promotion rules, evaluation mechanisms, mobility opportunities, career development practices, and the availability of positions at different hierarchical levels can influence how individuals progress through their careers. These mechanisms are particularly consequential in military organizations, where career progression is embedded in formal rank structures and where opportunities for advancement may depend on the availability of positions within specific categories or specializations. From this perspective, career development is not solely a matter of individual preparation for progression; it is also conditioned by the organizational structure through which progression takes place.

Recent research in the Portuguese military context provides empirical support for the relevance of these organizational conditions. Silva et al. (2026), in a study of People Analytics within the Portuguese Army, identified career development, communication and feedback, current functional status, and mobility and placement among the critical HRM dimensions examined. Their findings also highlighted structural challenges associated with career stagnation, perceived lack of transparency in evaluation and promotion systems, and functional misallocation in personnel placement. The authors argue that People Analytics can support more evidence-based career management, including decisions concerning mobility, progression, and talent development (Silva et al., 2026).

Although People Analytics and long-term workforce planning address different decision levels, this recent evidence is relevant to the present study because both approaches recognize the importance of organizational data and structures in shaping career management. People Analytics focuses primarily on using employee and organizational data to inform HR decisions, whereas long-term workforce planning focuses on anticipating and structuring future workforce requirements. Nevertheless, the two perspectives converge on an important principle: career outcomes are partly embedded in organizational systems and can therefore be examined through systematic analysis rather than solely through individual-level explanations. In the context of the Portuguese Army, the identification of career stagnation and structural rigidity further illustrates the potential consequences of organizational arrangements for individual career trajectories (Silva et al., 2026).

For the purposes of this study, career sustainability is therefore understood primarily as a longitudinal and organizationally embedded concept rather than as an outcome directly measured at the individual level. The study does not assess employees' perceptions of career satisfaction, well-being, motivation, or intentions to remain in the organization. Instead, it examines structural conditions that may facilitate or constrain career progression over time, particularly the distribution of positions across ranks and specializations. This distinction is important because the present research seeks to identify how workforce structures create different opportunities for career progression rather than to claim direct effects on individual career outcomes.

Workforce Planning as Career Architecture

The literature reviewed above suggests that long-term workforce planning and career development should not be considered as separate organizational processes. Strategic workforce planning seeks to anticipate and structure future workforce requirements, while career development concerns the progression of individuals within the organizational contexts in which their careers unfold. In hierarchical organizations, these dimensions intersect through the structure of positions available at different organizational levels. The distribution of positions therefore represents not only an allocation of organizational capacity but also part of the structural environment within which careers develop. This relationship is consistent with the concept of career architecture, which refers to the structures through which organizations define roles, levels, career paths, and opportunities for progression. Career architecture can therefore provide a framework for connecting organizational requirements with career development by making relationships between positions and potential career movements more explicit.

In highly hierarchical organizations, however, career architecture can be understood in a more structural and constrained sense. Career progression may depend not only on the existence of formal career paths or

competency requirements, but also on the number and distribution of positions available at successive hierarchical levels. In such settings, the personnel structure establishes the capacity of the organization to accommodate career progression over time. A change in the number of positions at one level may therefore affect not only current staffing but also the subsequent movement of personnel through the hierarchy.

This perspective is particularly relevant to military organizations, where career paths are formally structured and progression is strongly interconnected with workforce requirements. As discussed previously, military manpower planning has addressed recruitment, promotion, career paths, personnel allocation, and transition processes as interconnected components of long-term workforce management (Horn et al., 2016; Mazari-Abdessameud et al., 2020; Škraba et al., 2007). The present study extends this perspective by considering the personnel structure itself as part of the career architecture: the distribution of authorized positions across ranks and specializations creates the structural conditions within which military careers can progress.

From this perspective, workforce planning involves a dual alignment problem. First, the personnel structure must provide sufficient capacity to meet organizational and operational requirements. Second, it should provide a sufficiently coherent distribution of positions to support viable progression trajectories across the career structure. These objectives may not always be simultaneously achievable. Increasing positions at one rank may improve staffing capacity but alter progression dynamics elsewhere in the hierarchy; conversely, a structure that facilitates progression may generate personnel levels that do not correspond to operational requirements. Workforce planning therefore involves trade-offs between organizational capacity and career-related objectives.

The concept of career sustainability provides an additional perspective for understanding these trade-offs. Sustainable careers are shaped by the interaction between individuals, organizational contexts, and time (De Vos et al., 2019). In hierarchical organizations, the temporal structure of progression is partly embedded in the distribution of organizational positions. Consequently, workforce planning decisions may influence the conditions under which individuals move through different career stages, even though such decisions do not directly determine individual career outcomes. This distinction is important: the present study does not measure career satisfaction, well-being, motivation, or retention, but examines structural conditions that may facilitate or constrain career progression over time.

Accordingly, this study conceptualizes long-term workforce planning as a form of career architecture in which organizational workforce requirements and career structures are jointly considered. Under this perspective, the personnel structure is not merely an administrative representation of how many employees the organization requires. It is also a structural framework that determines the distribution of career opportunities across ranks and specializations and therefore contributes to shaping the trajectories available to personnel over time. This conceptualization provides the basis for examining the Portuguese Navy's Special Personnel Table from both an organizational and a career perspective.

METHODOLOGY

Research Design and Case Context

This study adopts a quantitative case-study design to examine the relationship between long-term workforce planning and career structures in a hierarchical organization. The Portuguese Navy was selected as the empirical setting because its personnel system combines formal hierarchical ranks, occupational specializations, statutory personnel ceilings, and predominantly internal career progression. These characteristics make the relationship between workforce structure and career development particularly explicit and provide an appropriate context for examining how long-term personnel planning can affect the structural conditions of military careers.

The analysis focuses on the officer category of the Portuguese Navy. Within this category, personnel are distributed across ranks and specializations according to the SPT. The SPT defines the authorized positions available within the organizational structure, while the military career system establishes progression between successive ranks. Because promotion to a higher rank within a specialization requires the availability of an

authorized position at that rank, the distribution of positions across the hierarchy represents an important structural condition for career progression.

The study examines the SPT from a long-term perspective rather than evaluating the annual personnel-allocation process itself. The objective is to derive a Reference Special Personnel Table (RSPT), conceived as a target personnel structure towards which annual SPTs can progressively converge. The RSPT is designed by considering organizational staffing requirements together with career-profile and sea-shore rotation objectives under the applicable personnel ceilings.

This design allows the study to examine workforce planning at two interconnected levels. At the organizational level, the analysis considers whether the personnel structure provides sufficient positions to meet identified staffing requirements. At the career level, it examines how the distribution of positions across ranks and specializations relates to desired career profiles and the distribution of service between sea and shore. The study therefore treats the personnel structure as both an organizational resource and a structural component of the career system.

Data Sources

The study combines documentary and expert-based data sources. Documentary sources comprised the applicable legal framework, the Navy's personnel-planning documents, the 2025 SPT, and the current inventory of personnel serving outside the organic structure. These sources were complemented by interviews with the two senior decision-makers who oversee personnel management in the Navy.

The legal framework provides the statutory constraints within which the personnel structure is defined. In Portugal, personnel ceilings established by the Government set the maximum number of permanent active-duty military personnel, with separate limits defined for each category and rank. The Navy subsequently distributes these positions across its specializations through the SPT.

Organizational staffing requirements were obtained from Navy planning documents and were defined separately for sea and shore assignments. For every combination of rank and specialization, availability was assumed to be full (100%), so that the number of positions considered corresponds to the minimum required to cover each identified staffing need. Career-profile and sea-shore rotation targets were obtained through consultation with the two senior decision-makers responsible for personnel management.

The analysis considers only specializations with continuing recruitment and long-term relevance to the officer workforce. Eight specializations met these criteria and were retained in the analysis: Marinha (M), Administração Naval (AN), Fuzileiros (FZ), Engenheiros Navais (EN), Médicos Navais (MN), Técnicos Superiores Navais (TSN), Serviço Técnico (ST), and Técnicos Superiores (TS). Músicos (MUS) was excluded because of its specific characteristics and residual staffing requirements, while specializations being phased out were excluded because they were assumed not to require positions in the long-term reference structure.

A specific methodological distinction concerns personnel serving inside and outside the organic structure of the Armed Forces (EOFFAA). Positions within the organic structure are those defined in the SPT, while personnel placed outside it are accounted for in the Attaché Personnel Table (APT), which has its own statutory ceilings. As no official APT existed at the time of the study, the current inventory of personnel serving outside the EOFFAA was taken as its empirical basis.

The APT is therefore relevant to the construction and interpretation of the RSPT because personnel serving outside the EOFFAA remain part of the Navy's authorized workforce, even though their positions are not represented in the SPT. The model consequently considers the total personnel ceiling by rank before deriving the RSPT from the Global Reference Table (GRT). This distinction is important because the number of positions available within the EOFFAA is not necessarily equivalent to the difference between the total statutory ceiling and the current APT inventory. The resulting RSPT therefore reflects the actual distribution of personnel between the organic structure and positions outside it, rather than simply reproducing the statutory ceilings applicable to the EOFFAA.

The use of senior decision-makers as a source of expert information was particularly relevant for variables that cannot be derived directly from administrative records, namely the desired career-profile and sea-shore rotation targets. Their input therefore served to operationalize organizational and career expectations within the reference workforce structure.

Model Variants and Development of the Reference Workforce Structure

The Reference Special Personnel Table was developed through a weighted goal-programming approach designed to identify a personnel structure that balances competing organizational and career-related objectives. The approach considers three dimensions: staffing requirements, career-profile targets, and sea-shore rotation, while respecting the applicable personnel ceilings. The formulation therefore treats the personnel structure as the outcome of a multi-objective planning problem rather than optimizing a single workforce criterion.

Three model variants were considered. The first incorporates staffing requirements and career-profile objectives; the second incorporates staffing requirements and sea-shore rotation objectives; and the third combines staffing requirements, career-profile objectives, and sea-shore rotation. The comprehensive formulation was used to derive the reference structure because it allows the interaction between organizational staffing and the two career-related dimensions to be examined simultaneously. Equal weights were initially assigned to the three dimensions. This specification was adopted as a transparent baseline that avoids imposing an explicit *a priori* hierarchy between staffing, career-profile, and sea-shore objectives. It should not, however, be interpreted as implying that the three objectives have identical substantive importance; rather, it provides a reference configuration against which alternative weighting schemes can be assessed.

The resulting structure was subsequently adjusted to the distinction between personnel serving inside and outside the EOFAA. Because the career-profile and sea-shore estimates could not be separated between these two contexts, the model was parameterized for their combined universe. The resulting Global Reference Table (GRT) was then converted into the RSPT by subtracting the current APT, following the relationship $RSPT = GRT - APT$.

The RSPT is therefore interpreted as a long-term reference structure rather than as a mandatory annual personnel allocation. Its purpose is to provide a target configuration against which future SPTs can be assessed and towards which annual workforce decisions can progressively converge. This interpretation is particularly relevant to the present study because it allows the personnel structure to be examined as a long-term career architecture rather than solely as an annual staffing instrument.

The analysis focuses on the implications of the resulting reference workforce structure for organizational staffing and career progression. The RSPT is compared with the personnel structure currently in force to identify structural differences across ranks and specializations, with particular attention to career-profile deviations and the resulting distribution of positions across the hierarchical structure. The analysis also examines the trade-offs between organizational staffing requirements, career-profile targets, and sea-shore rotation reflected in the optimized structure.

RESULTS

The Reference Workforce Structure

The comparison between the RSPT and the 2025 Special Personnel Table (SPT2025) reveals a relatively small overall difference in the number of positions, but substantial changes in their distribution across ranks and specializations. As shown in Table 1, the overall difference between the two structures is three positions, indicating that the reference structure does not imply a substantial change in the aggregate number of authorized positions. Rather, its main effect concerns the redistribution of positions across the hierarchical and occupational structure.

Table 1 - Differences in the Number of Positions Between the Reference Special Personnel Table and the 2025 Special Personnel Table, by Rank and Specialization (RSPT – SPT2025)

	M	ECN	MN	FN	AN	EMN	SE	FZ	MUS	EN	TSN	ST	TS	Total
CMG	-8	0	-3	-1	5	0	-2	7	0	6	-1	0	0	3
CFR	-8	0	12	-1	-8	0	-3	10	-1	4	10	6	0	21
CTEN	37	0	-3	0	8	0	0	5	-1	8	-12	-52	5	-5
SALT	-38	0	-43	0	3	0	0	9	-1	-9	33	12	18	-16
Total	-17	0	-37	-2	8	0	-5	31	-3	9	30	-34	23	3

Note: Positive values indicate positions added in the RSPT relative to the SPT2025 and negative values indicate positions removed. Specializations excluded from the reference structure show negative differences corresponding to the positions they hold in the SPT2025. RSPT = Reference Special Personnel Table; SPT2025 = Special Personnel Table in force for 2025.

At the rank level, the distribution of these changes is uneven. The RSPT includes three more positions at the CMG level and 21 more positions at the CFR level than the SPT2025. Conversely, the CTEN and SALT levels show reductions of five and 16 positions, respectively. This pattern indicates a shift in the vertical distribution of positions, with greater representation at the upper levels of the hierarchy and fewer positions at the lower levels.

The differences are also substantial across specializations. The largest increases occur in FZ (+31), TSN (+30), and TS (+23), followed by EN (+9) and AN (+8). In contrast, substantial reductions are observed in MN (-37), ST (-34), and M (-17). Other specializations show comparatively small changes or no change. The specializations excluded from the reference structure, namely MUS and those being phased out, appear in Table 1 with negative differences corresponding to the positions they still hold in the SPT2025, as the RSPT assigns them no positions. These results indicate that the reference structure does not simply expand or contract the workforce uniformly; instead, it reallocates structural capacity across specializations according to the combination of workforce and career-related objectives considered by the model.

The relevance of these differences becomes clearer when the RSPT is considered as a career structure rather than solely as a staffing allocation. The redistribution of positions across ranks changes the number of positions available at successive stages of the military hierarchy, while the redistribution across specializations changes the career opportunities available within specific professional trajectories. Thus, even though the aggregate change in the number of positions is limited, the structural implications for career progression may be considerably greater.

The results therefore suggest that the value of the RSPT lies primarily in the configuration of the workforce rather than in an increase in its overall size. The reference structure provides a different distribution of positions across the career hierarchy and specializations while maintaining a broadly similar aggregate workforce level. This finding is particularly relevant from a career-management perspective because it indicates that changes in the structural distribution of positions may have meaningful implications for career progression even when the total number of positions remains relatively stable.

Career-Related Implications of the Reference Structure

The differences between the RSPT and the SPT2025 have implications beyond the redistribution of personnel positions, as they modify the structural conditions within which military careers develop. In a hierarchical career system, the number and distribution of positions across successive ranks influence the capacity of the organization to accommodate progression within each specialization. The results in Table 1 therefore provide an indication of how the proposed long-term workforce structure changes the distribution of career opportunities relative to the current structure.

At the hierarchical level, the RSPT increases the number of positions at CMG (+3) and, particularly, at CFR (+21), while reducing the number of positions at CTEN (-5) and SALT (-16). This redistribution changes the shape of the rank structure without substantially changing its overall size. From a career perspective, the increase in positions at the higher ranks represents greater structural capacity at those stages of the career hierarchy, whereas the reduction at lower ranks indicates a different distribution of positions across career stages.

The effects are more pronounced when specializations are considered. The largest increases in positions occur in FZ (+31), TSN (+30), and TS (+23), whereas the largest reductions occur in MN (-37), ST (-34), and M (-17). These differences indicate that the reference structure does not apply a uniform adjustment across the officer workforce. Instead, it establishes different structural conditions for career progression depending on the specialization.

This finding is particularly relevant because career progression in a military organization is embedded in the distribution of positions across ranks within each specialization. Consequently, an increase or decrease in positions at a particular rank may alter the structural capacity for progression through that part of the career hierarchy. The implications should therefore be understood in terms of the availability and distribution of career positions rather than as direct effects on individual career outcomes.

The results also show that relatively small changes in the aggregate workforce can coexist with substantial changes in career structure. The RSPT contains only three more positions overall than the SPT2025, yet the redistribution across ranks and specializations is considerable. This indicates that the relevance of long-term workforce planning for career management does not depend solely on changes in total personnel numbers. The internal configuration of the workforce, particularly, the distribution of positions across hierarchical levels and specializations, may be equally important.

From the perspective of career architecture, the RSPT can therefore be interpreted as a structural reference for the distribution of future career opportunities. It does not determine individual progression, which remains subject to statutory requirements and other personnel-management criteria, but it establishes the organizational capacity within which progression can occur. The results consequently support the view that long-term workforce planning can contribute to career management by explicitly incorporating the distribution of positions across the career hierarchy into the design of the future workforce structure.

At the trajectory level, the implications of the RSPT can be understood as changes in the structural capacity available at successive career stages. For example, an increase in positions at a higher rank within a specialization may reduce structural constraints on progression into that rank, whereas a reduction in positions may increase the potential for promotion bottlenecks. The resulting structure may therefore influence the time personnel remain at different career stages and the capacity of the organization to accommodate progression towards higher ranks. However, the present model does not estimate individual time-to-promotion or the probability of reaching a given rank, because these outcomes also depend on individual performance, seniority, statutory requirements, attrition, and promotion decisions. These indicators should therefore be examined in future longitudinal analyses linking successive personnel structures to observed career histories.

Trade-offs Between Workforce Requirements and Career Structure

The results indicate that the different dimensions of workforce planning cannot always be simultaneously satisfied within the existing personnel structure. Staffing requirements, career-profile objectives, and the distribution of personnel across different types of assignments compete for the same limited set of authorized positions. Consequently, improving the alignment with one dimension may require accepting deviations in another.

This trade-off is particularly relevant from a career perspective. A workforce structure designed primarily to satisfy operational requirements may provide fewer positions at some stages of the career hierarchy than would be desirable from a career-development perspective. Conversely, increasing positions to facilitate progression may generate a structure that is less closely aligned with operational staffing requirements. The results

therefore suggest that career-related imbalances should not necessarily be interpreted as isolated shortcomings in career management, since they may reflect broader constraints inherent to the workforce system.

The value of long-term workforce planning consequently lies not in eliminating all trade-offs, but in making them explicit and assessable. By incorporating career-related objectives into the design of the reference workforce structure, decision-makers can identify where organizational requirements, and career considerations converge and where they compete. This provides a basis for more informed HR decisions concerning the future distribution of positions and the structural conditions supporting military career progression.

DISCUSSION

The findings provide empirical support for viewing long-term workforce planning as more than a mechanism for matching workforce supply with organizational staffing requirements. Although the RSPT differs from the SPT2025 by only three positions in aggregate, the redistribution across ranks and specializations is substantial. This result highlights that the strategic relevance of workforce planning lies not only in the size of the workforce but also in its internal configuration. In hierarchical organizations, this configuration establishes the structural conditions within which personnel progress through their careers.

This finding extends the workforce-planning perspective discussed in the literature by connecting organizational workforce structure with career development. Previous research on military manpower planning has recognized the interdependence between recruitment, promotion, career paths, and personnel requirements (Horn et al., 2016; Mazari-Abdessameud et al., 2020). The present study complements this perspective by showing how the distribution of authorized positions itself can be used as a reference mechanism for aligning workforce requirements with desired career structures. The RSPT can consequently be understood as an organizational component of career architecture: it does not determine individual careers but establishes part of the structural environment in which those careers develop.

The use of weighted goal programming also introduces important methodological limitations. The assignment of weights to the different objectives inevitably involves a degree of subjectivity, particularly when organizational staffing, career-profile alignment, and sea–shore rotation represent competing priorities. In the present study, equal weights were assigned to the three dimensions to provide a transparent baseline and to avoid imposing an explicit normative hierarchy among them. However, equal weighting should not be interpreted as demonstrating that the three objectives have identical substantive importance. Different managerial or policy priorities could reasonably lead to different weight configurations and, consequently, to alternative reference workforce structures. The RSPT should therefore be understood as a decision-support solution conditional on the objectives, assumptions, and weights specified in the model, rather than as a uniquely optimal personnel structure.

This limitation also points to the potential value of alternative optimization approaches. Multi-objective optimization could be used to examine the set of Pareto-efficient workforce structures rather than selecting a single solution based on predetermined weights. Lexicographic goal programming could alternatively impose a hierarchy among objectives when certain organizational requirements are considered non-negotiable, while robust optimization could be used to assess how workforce structures perform under uncertainty in staffing requirements or career assumptions. These approaches could provide complementary perspectives on the robustness of the reference structure. Nevertheless, weighted goal programming was considered appropriate for the present study because it provides an interpretable compromise solution and allows organizational and career-related objectives to be represented within a common decision-support framework.

The equal-weight specification also limits the extent to which the robustness of the RSPT can be assessed within the present analysis. Although equal weights provide a transparent baseline, alternative weighting schemes reflecting different strategic priorities may produce different reference structures. A systematic sensitivity analysis could therefore examine the extent to which changes in the relative importance assigned to staffing requirements, career-profile alignment, and sea–shore rotation alter the resulting RSPT. Such an analysis would provide an additional assessment of the stability of the reference structure and could help

decision-makers identify which structural recommendations remain robust across different priority configurations.

The findings are also consistent with the literature on sustainable careers, which emphasizes the interaction between individuals, organizational contexts, and time (De Vos et al., 2019). In the present case, the temporal dimension of careers is embedded in the distribution of positions across successive hierarchical levels. A workforce structure that is poorly aligned across these levels may constrain the organization's ability to provide coherent progression opportunities, even when its aggregate personnel capacity is broadly adequate. The results therefore reinforce the importance of considering career structures when designing long-term workforce strategies.

The recent evidence from the Portuguese Army further strengthens this interpretation. Research on People Analytics in the Portuguese Army has identified career stagnation, promotion and evaluation processes, mobility, and personnel placement as relevant dimensions of contemporary military HRM (Silva et al., 2026). While People Analytics and workforce planning operate at different analytical levels, both perspectives point towards the importance of using organizational data to identify and address structural conditions affecting career management. The present study contributes to this discussion by moving from the diagnosis of career-related challenges towards the prospective design of a workforce structure intended to support future career trajectories.

A further step in developing the RSPT would be its empirical validation against observed career outcomes. Such validation could be conducted longitudinally by comparing the career trajectories of personnel working under successive SPT configurations with the structural expectations represented in the RSPT. Relevant indicators could include time to promotion between successive ranks, the proportion of personnel reaching higher hierarchical levels, promotion bottlenecks across specializations, and the distribution of career progression over time. Where appropriate, these structural indicators could also be complemented by individual-level measures such as retention, perceived career opportunities, or career satisfaction. Such an approach would allow future research to assess whether the structural conditions identified by the RSPT are associated with the career outcomes observed in practice. Importantly, this validation should not be interpreted as testing whether the RSPT determines individual careers, since promotion outcomes remain dependent on statutory requirements, individual characteristics, performance, and other personnel-management criteria. Rather, empirical validation would assess whether the workforce configurations identified by the model are consistent with, and potentially supportive of, viable career trajectories over time.

An important implication of the findings is that career-related imbalances cannot necessarily be interpreted independently of the broader workforce configuration. The trade-offs identified in the results show that staffing requirements and career objectives may compete for the same limited set of positions. This distinction is particularly relevant for strategic HRM because it differentiates problems related to workforce capacity from those related to workforce configuration. The appropriate response may therefore involve not only changes in workforce size, but also the redistribution of positions across ranks and specializations. The APT dimension further illustrates that workforce planning cannot be reduced to the distribution of positions within the organic structure alone, since personnel serving outside that structure also affect the effective configuration of the Navy's authorized workforce.

Taken together, the findings suggest that long-term workforce planning can function as a strategic mechanism for integrating organizational and career perspectives. Rather than treating career management as a process that begins after the workforce structure has been established, organizations with highly structured career systems can incorporate career requirements into the design of that structure itself. For the Portuguese Navy, the RSPT provides such a mechanism by establishing a long-term reference against which annual personnel structures can be evaluated and progressively adjusted. More broadly, the approach illustrates how workforce planning can contribute to the design of organizational conditions that support viable career trajectories while maintaining alignment with operational requirements.

Although the study is situated in the Portuguese Navy, the underlying workforce-planning logic may be relevant to other hierarchical organizations in which recruitment, progression, and workforce allocation are

strongly conditioned by authorized positions and formal career structures. This includes other military services, police and fire organizations, and segments of the civil service where career progression is structured around predefined grades or positions. In such contexts, a reference workforce structure could similarly be used to examine the relationship between organizational staffing requirements and the distribution of positions across career stages. However, the transferability of the framework should not be assumed to be automatic. Differences in recruitment practices, promotion rules, workforce mobility, contractual arrangements, and institutional constraints may require adaptation of the objectives, constraints, and parameters of the model. The contribution of the present study is therefore best understood as providing a transferable planning logic rather than a directly generalizable personnel structure.

The practical value of the RSPT depends on how it is incorporated into the annual workforce-planning cycle. Rather than replacing the annual SPT, the RSPT should serve as a long-term reference against which annual workforce configurations can be assessed. At the beginning of each planning cycle, the current personnel structure and the proposed annual SPT could be compared with the RSPT to identify persistent deviations by rank and specialization. These deviations could then be assessed in relation to operational requirements, career-profile objectives, and sea-shore distribution, allowing personnel planners to distinguish between temporary adjustments and more persistent structural imbalances. Where deviations are considered strategically relevant, the RSPT could inform decisions on the creation, reduction, or redistribution of positions in subsequent annual SPTs.

This process would position the RSPT as a dynamic planning reference rather than a fixed personnel target. Its use should therefore be accompanied by periodic reassessment of workforce requirements, career expectations, personnel availability, and institutional priorities. Changes in the operational environment or in the Navy's personnel policies may require the reference structure itself to be updated. In this sense, the RSPT can provide continuity between long-term workforce planning and annual personnel decisions while preserving the flexibility required to respond to changing organizational conditions.

The implementation of the RSPT would nevertheless involve several organizational and managerial challenges. First, its effectiveness would depend on the availability and quality of workforce data, particularly regarding personnel movements, assignments outside the organic structure, and changes in career status. Second, the career-profile and sea-shore targets incorporated into the model depend partly on managerial judgement and may therefore require periodic review as operational priorities and personnel policies evolve. Third, implementation may encounter institutional resistance where changes in the distribution of positions affect established career expectations or organizational arrangements. Finally, the use of an optimization-based reference structure requires decision-makers to understand both its assumptions and its limitations.

These challenges suggest that implementation should be gradual and embedded within existing workforce-planning processes rather than introduced as a standalone planning mechanism. A practical approach would combine regular data updates, periodic review of model parameters and objectives, consultation with relevant personnel stakeholders, and transparent communication of the rationale underlying proposed structural changes. The RSPT could initially be used as a diagnostic and planning reference, allowing deviations from the long-term structure to be identified and discussed before being translated into changes in annual personnel tables. Such an approach would support organizational learning and facilitate the progressive integration of analytical workforce planning into established personnel-management practices.

CONCLUSIONS

This study examined long-term workforce planning as a mechanism for connecting organizational workforce requirements with the structural conditions of military careers. Using the Portuguese Navy as a case study, the analysis developed a RSPT that integrates staffing requirements with career-profile and sea-shore rotation objectives under statutory personnel constraints. The results show that a workforce structure can remain broadly stable in aggregate terms while undergoing substantial changes in the distribution of positions across hierarchical levels and specializations.

The findings highlight the importance of considering workforce structure as part of career architecture. In a hierarchical organization such as the Portuguese Navy, the distribution of authorized positions across ranks and specializations contributes to defining the structural capacity available for career progression. The RSPT therefore provides more than a long-term staffing target: it offers a reference structure through which the organization can assess the alignment between workforce requirements and the career opportunities embedded in its personnel system.

The study also demonstrates that organizational and career objectives may involve structural trade-offs. Staffing requirements, career-profile objectives, and sea-shore rotation cannot necessarily be fully satisfied simultaneously within a fixed personnel structure. Consequently, career-related deviations should not automatically be interpreted as failures of career management, since they may reflect broader workforce constraints or incompatibilities between competing organizational objectives. This distinction can support more informed HR decision-making by identifying whether an imbalance requires additional workforce capacity or a different distribution of existing positions.

The study contributes to the literature by bringing together two perspectives that are often considered separately: strategic workforce planning and career development. While previous research has demonstrated the value of quantitative approaches to military manpower planning, this study emphasizes the role of the long-term workforce structure in shaping the organizational context in which careers develop. In this sense, workforce planning can be understood not only as a process of determining how many personnel an organization needs, but also as a process of designing the structural conditions under which careers can progress.

For practice, the RSPT provides a prospective reference against which annual personnel structures can be assessed and progressively adjusted. This approach may help military HR decision-makers move from predominantly reactive annual workforce planning towards a more strategic and forward-looking process, while making explicit the implications of personnel-structure decisions for career development. Although the study is based on the Portuguese Navy and its specific institutional context, the underlying approach may be relevant to other hierarchical organizations in which career progression is strongly dependent on the availability and distribution of organizational positions.

Future research should examine the longitudinal effects of implementing a reference workforce structure and investigate how structural career conditions interact with individual career perceptions, career sustainability, retention, and organizational commitment. Such research would allow the relationship identified in the present study between workforce structure and career architecture to be tested from both organizational and individual perspectives.

REFERENCES

1. Abreu, J. (2023). Modelo organizacional de gestão da carreira dos oficiais da classe de administração naval: A especialização como estudo de caso [Master's dissertation, Escola Naval]. Repositório Comum. <http://hdl.handle.net/10400.26/49048>
2. Bositkhanova, N., & Dadaboyev, S. M. U. (2025). Revolutionizing workforce planning: The strategic role of AI in HR strategy. *Discover Global Society*, 3, Article 100. <https://doi.org/10.1007/s44282-025-00252-y>
3. De Vos, A., Van der Heijden, B. I. J. M., & Akkermans, J. (2019). Sustainable careers: Towards a conceptual model. *Journal of Vocational Behavior*, 117, 103196. <https://doi.org/10.1016/j.jvb.2018.06.011>
4. Georgescu, I., Kinnunen, S., & Botezatu, M. A. (2024). Enhancing organizational resilience: The transformative influence of strategic human resource management practices and organizational culture. *Sustainability*, 16(10), 4315. <https://doi.org/10.3390/su16104315>
5. Governo da República Portuguesa. (2025). Programa do XXV Governo Constitucional 2025. <https://www.portugal.gov.pt/pt/gc25/governo/programa-do-governo>

6. Horn, M., Elgindy, T., & Gomez-Iglesias, A. (2016). Strategic workforce planning for the Australian Defence Force. *Journal of the Operational Research Society*, 67(4), 664–675. <https://doi.org/10.1057/jors.2015.85>
7. Huq, S. N. (2026). A mathematical decision framework for strategic workforce planning and resource allocation under organizational uncertainty. SSRN. <https://doi.org/10.2139/ssrn.7087041>
8. Mazari-Abdessameud, O., Van Utterbeeck, F., Van Acker, G., & Guerry, M.-A. (2020). Multidimensional military manpower planning based on a career path approach. *Operations Management Research*, 13, 249–263. <https://doi.org/10.1007/s12063-020-00165-w>
9. Neves, P. (2023). A retenção dos militares na Marinha Portuguesa [Master's dissertation, Escola Naval]. Repositório Comum. <http://hdl.handle.net/10400.26/49043>
10. Peck, W. J. (2025). Workforce planning: A review of methodologies. *Annals of Operations Research*, 352(1–2), 251–294. <https://doi.org/10.1007/s10479-025-06734-1>
11. Provost, F., & Fawcett, T. (2013). Data science for business: What you need to know about data mining and data-analytic thinking. O'Reilly Media.
12. Santos, A., Silva, G., Júnior, E., & Moreira, A. (2021). Distribuição dos recursos humanos pelas organizações militares do exército brasileiro. *Textos para Discussão*, 1(1), 772–789. <https://ojs.periodicos.unis.edu.br/textosparadiscussao/article/view/512>
13. Silva, J. F. D., Magalhães, F. I. R. de, & Menezes, E. S. N. de O. de F. e. (2026). People Analytics in the Portuguese Army. *Proelium*, 8(18), 207–220. https://doi.org/10.60746/8_18_44407
14. Sinclair, A. (2004). Workforce planning: A literature review. Institute for Employment Studies. <https://www.employment-studies.co.uk/system/files/resources/files/mp37.pdf>
15. Škraba, A., Kljajić, M., Knaflič, A., Kofjač, D., & Podregar, I. (2007). Development of a human resources transition simulation model in Slovenian Armed Forces. In J. D. Sterman (Ed.), *Proceedings of the 25th International Conference of the System Dynamics Society* (pp. 4480–4490). System Dynamics Society. <https://proceedings.systemdynamics.org/2007/proceed/papers/SKRAB517.pdf>
16. Tordera, N., Peiró, J. M., Ayala, Y., Villajos, E., & Truxillo, D. (2020). The lagged influence of organizations' human resources practices on employees' career sustainability: The moderating role of age. *Journal of Vocational Behavior*, 120, Article 103444. <https://doi.org/10.1016/j.jvb.2020.103444>
17. Van der Heijden, B. I. J. M., De Vos, A., Akkermans, J., Spurk, D., Semeijn, J., Van der Velde, M., & Fugate, M. (2020). Sustainable careers across the lifespan: Moving the field forward. *Journal of Vocational Behavior*, 117, 103344. <https://doi.org/10.1016/j.jvb.2019.103344>
18. Waghmode, M. L., & Jamsandekar, P. P. (2014). Decision support systems and its applications in different sectors: Literature review. *International Journal of Advance Research in Computer Science and Management Studies*, 2(1), 110–115. <https://ijarcsms.com/docs/paper/volume2/issue1/V2I1-0012.pdf>