



# Personas in scenario building: Integrating human-centred design methods in foresight

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## ABSTRACT

This paper contributes to integrating human-centred design approaches in foresight. We emphasize design thinking as an approach that incorporates user-centred concepts and artefacts, enabling the creation and visualization of potential futures and mediating the exploration of new perspectives and areas of intervention for innovation. However, there is limited discussion in the foresight literature on the meaningful application of design approaches. We focus on the persona method and its roles and applications in scenario building. To be meaningful in scenario building, personas need to appropriately integrate users' future needs, expectations and behaviours that shape and in turn are shaped by contexts that are yet to be realised. Based on an analysis of published case studies, the paper underscores the role of personas in fostering creative imagination, enhancing scenario engagement, and prospective sensemaking beyond their application as a storytelling vehicle in scenarios. We link persona characteristics and design to their roles in scenario building, allowing design and foresight practitioners the flexibility to tailor the persona approach to different contexts and critically assess the underlying limitations. From this, we provide recommendations for incorporating personas in scenario building and conclude with suggestions for future research.

## 1. Introduction

Foresight is a contemporary requirement for organisations that underscores the need for new strategic and design approaches to innovation. In this sense, the integration of foresight and human-centred design, often referred to as 'human-centred foresight' or 'design-driven foresight' (Neuhoff et al., 2021) proves advantageous for organizations contending with an unpredictable future (Gordon et al., 2019). The ambition of integrating the human perspective in foresight through design methods is that of providing insights on future user needs and expectations, identifying future challenges and exploring user behaviours in different future contexts, thus supporting organisations in new product development, strategy-building and decision-making (Bühning & Liedtka, 2018; Gordon et al., 2019; Pruitt and Adlin, 2006).

Foresight, particularly in the context of the firm, can be conceptualised as "identifying, observing and interpreting factors that induce change, determining possible organization-specific implications, and triggering appropriate organisational responses" (Rohrbeck et al., 2015 p.2). We argue that not only is foresight concerned with exploring the changing landscape, but that design

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influences this landscape by using methods and tools to facilitate collaborative processes of meaning-making and translating meaning among diverse stakeholders (Simeone et al., 2017). In our perspective, it is timely to explore new approaches that project users into the future and to interpret how user needs and behaviours are influenced and shaped by future contexts or scenarios that are yet to be realised (Bühning & Liedtka, 2018; Fergnani, 2019; Gordon et al., 2019). This paper focuses on the integration of human-centred design methods and foresight. On the one hand, this integration will inform design practice when planning for possible areas of intervention in the design and development of innovative solutions (Dorst, 2011; Meinel et al., 2011). When applied to foresight, on the other hand, design methods must go beyond current user needs and scan future attitudes, behaviours, and requirements, using insights from individuals not to just tell stories about the future, but to create meaningful representations of the future (Hofmann, 2020). However, this integration is challenging, especially because human-centred design methods may not sufficiently reflect the requirements and principles that can be applied when generating design solutions for the future (Adikari et al., 2023).

Amongst the human-centred design methods, the persona approach is used in foresight as a communication tool, to create lively descriptions of scenarios and establish an emotional connection with the audience (Fergnani, 2019). In this context, personas serve the purpose of better engaging with scenarios by focussing more directly on the individual which is a crucial aspect for communication. A persona is a profile representing a particular group of people, such as customers or users, a market segment, a subset of employees, or any other stakeholder group, that share common behavioural characteristics, goals and motivations (Stickdorn et al., 2019). Design and futures practitioners involved in anticipating future consumer trends, technology advancements or disruptions caused by socio-technical shifts, may resort to creating personas to understand user behaviours, needs and desires, and exploit these to define the possible areas of intervention during the design and development of innovative solutions (Gordon et al., 2019; Meinel et al., 2011). While we argue that in design, personas need to go beyond a description of current user needs and consider future requirements and expectations (Evans, 2014), foresight needs to explore the full potential of personas, moving beyond their application as a storytelling vehicle and narration tool in scenarios (Fergnani, 2019; Marshall et al., 2023). In design, personas are developed using data about users' present day needs and behaviours, whereas in foresight, insights about the future are based on speculation about possible and desirable future worlds that are yet to unfold and for which we lack complete information (Liveley et al., 2021; Miller, 2024). We work through these apparent conceptual and methodological discrepancies, to demonstrate how the persona approach can be used as a tool to "expand perceptions of the future in the present" (Lambert et al., 2024, p.2). As Liveley et al., (2021) put it, participants "imagine the future differently when doing so through the eyes of another imaginary person" (p.4). We therefore identify a gap in both the domains of foresight and design, in respect to applying the persona method.

The paper aims to address this gap by investigating the role of the persona method in scenario building, seeking to understand how it could be adopted to better reflect future user needs and expectations. In this study, scenarios are defined as vivid descriptions or narratives of the future (Fergnani, 2019; Rutting et al., 2024). They represent alternative images of the future, often focussing on preferable or desirable futures but also depicting feared futures or worse case scenarios (Durance & Godet, 2010). By analysing 17 published case studies, we critically assess the applications of the persona approach as a human-centred design method in scenario building. The paper makes two main contributions. First, it defines a broad scope for the use of personas in scenario building as fostering creative imagination, communication and sensemaking futures. Second, the paper identifies the attributes of personas and their roles in scenario building with the imperative that personas address future user needs and expectations. It discusses the methodological challenges of using personas in scenario building and the need to acknowledge future uncertainty and speculation in design practice.

The remainder of the article is structured as follows. In Section 2 we review the literature that links personas to design thinking and to scenarios. Section 3 presents the methodology, which is followed by the findings in Section 4 that focus on two aspects: how personas are represented and the roles these fulfil in scenario building. Section 5 highlights key aspects of integrating personas in scenario building. Then Section 6 provides insights and suggestions for practitioners in the foresight and futures field when using personas in a scenario process. The article concludes in Section 7 with implications and suggestions for further research.

## 2. Application of personas in design thinking and scenario building

### 2.1. Personas in design thinking

To narrow our discussion on the use of personas in design, we focus on the process of design thinking. As a human-centred approach, design thinking focuses on users' desires and needs within the socio-economic context in which the design process takes place (Liedtka, 2015; Ollenburg, 2018). Acquiring a deep understanding of users' needs is therefore critical for design practice because

**Table 1**

The use of personas in design practice.

Persona uses in design	Benefits of persona for designers/design teams	Sources
Conveying information and data on target users' needs and expectations	Develop a vivid and memorable description of users' needs and foster a shared understanding of the target audience	Nielsen (2019); Pruitt and Grudin (2003)
Understanding human behaviours	Orient the design action towards users' real needs and desires, avoiding the designer's unconscious, individual biases	Pruitt and Adlin (2006);
Assisting in decision-making throughout different stages of the design process	Empower the design team to prioritise and decide on specific features and guide user testing	Salminen et al. (2022); Pruitt and Grudin (2003); Cooper and Reimann (2003)

this insight allows designers to create innovations that are more readily adopted by users. One of the methods to report and visualise user data is using personas, described as fictitious characters that represent target user groups with shared characteristics and needs (Cooper, 1999; Cooper & Reimann, 2003; Pruitt & Adlin, 2006). Designers build customer personas in a design process to reflect upon specific situations and define potential problems and needs as well as develop innovative or alternative designs and solutions that work within future design contexts and spaces (Cooper, 1999; Pruitt & Adlin, 2006).

There is no standard method of representing a persona, but this is typically achieved using a profile card or fact sheet built from knowledge of real users such as their social background and demographic information and from elements of fictitious information that might include users' psychological characteristics, and their emotional relationship with the focus area. As seen in Table 1, designers utilise personas in different aspects of the design process such as in communicating the findings about user research to the project team (designers, developers, project managers, clients, etc.) and in developing a vision of user needs and expectations (Pruitt & Grudin, 2003; Stickdorn et al., 2019).

Personas play a crucial role in humanising the design process, conveying user needs and characteristics in a memorable and relatable way, capturing the interest of the target audience. Likewise, personas could be used to identify the pain points and challenges that orient design actions towards more inclusive solutions that meet users' expectations, literally stepping into the users' shoes (Miaskiewicz & Kozar, 2011). Creating personas relies on data about the expectations, desires and needs of users, obtained through qualitative and/or quantitative user analysis (Jansen et al., 2021). The meticulous process of sourcing user data allows design teams to align user goals and preferences, making it easier to prioritise and decide on specific features and functionalities. However, this does not eliminate the need to test the design with real users (Cooper, 1999; Cooper & Reimann, 2003; Pruitt & Grudin, 2003).

The benefits of adopting personas may not all relate to foresight, that addresses the impacts of broader technological, environmental, social, and political drivers in shaping future developments. The following section aims to position our research in relation to a discussion on the use of personas in scenario building. We will argue that combining personas and scenario building also allows for integrating aspects from design into the scenario process.

## 2.2. Personas and scenarios

Scenarios are widely adopted in both design thinking and foresight (Schwarz et al., 2023). Design scenarios are narrowly focused on specific design contexts (challenges, problems, and new possibilities) and within the scenarios, personas have been extensively used to develop vivid and engaging stories of users interacting within new real-life situations such as new technology and product development, evolving work and educational practices among others (Nielsen, 2019). This contrasts with the foresight context, where personas represent the preferences and behaviours of characters engaging with multiple possible future scenarios, rather than focusing on a specific or refined outcome (Zaidi, 2019).

Scenarios are often criticised for providing insufficient context and purpose (Chermack, 2022; O'Brien & Meadows, 2013). Creating personas as characters that interact within future scenarios is one way of providing context to scenarios. Fergnani (2019) mentions the future persona as a "powerful narrative tool(s) that can substantially enrich scenarios, exposing the key take-aways of a scenario planning exercise" (p.447). Thus, personas can be used to incorporate emotional and behavioural elements that make scenarios more engaging to the audience (Fergnani, 2019). Since personas are modelled on users and user behaviours and needs, they embed individual beliefs and values, group biases and collective judgments that influence how scenarios are shaped and interpreted (Schirmeister et al., 2020; Stingl and Gerdali, 2023). This may limit the use of personas in the scenario process because it encourages participants to envision futures as being simply an extension of the current world (Liveley et al., 2021); whereas in a futures context, the aim of integrating personas is that of broadening the span of thinking about alternative futures by setting aside personal biases and norms and eliciting participants' creative imagination.

Despite the differences in scope and application of personas in design thinking and foresight, there is a common purpose of engaging an audience – these are users in a design context and stakeholders in scenario building - with new situational contexts through scenario narratives. Yet, personas have been described as "motionless portraits, usually contained within a single finite and static document" providing a snapshot of relevant information about users (Pruitt & Adlin, 2006 p.36). In a design context, personas portray users' present needs and desires, guiding possible areas of intervention in the design and development of innovative customer solutions (Dorst, 2011; Meinel et al., 2011). Whereas in foresight, personas aim to engage users with futures that are yet to be realized, and that may be elusive and ill-defined (Liedtka, 2015; Fergnani, 2019). In this context, personas represent users' future needs and expectations that are derived from scenario key-features or scenario factsheets and are therefore based on a degree of speculation. In order to bridge the gap between the intended use of personas in the design and foresight fields, personas should be depicted as characters both of the future and from the future, thereby embracing the speculative and unknown. Our aim is to understand how personas can help engage participants in speculative and imaginative thinking, expanding their perspectives on the future and fostering critical reflection on future uncertainties, thereby enhancing futures literacy (Miller, 2024). We achieve this by unravelling the traits and features of personas and by exploring further how the persona method as a design practice can be applied in scenario building.

## 3. Methodology

We aimed to provide "fresh, new perspectives on the topic" of personas and their integration in scenario-building through a review of relevant literature (Torraco, 2016 p.405). We followed Torraco (2016)'s checklist for organising a literature review that includes a critical analysis of themes characterising personas and their roles in scenario building, and suggesting future directions for further

research. The first stage was dedicated to searching for cases that adopted the persona method alongside future scenarios, using the Web of Science and Scopus as the main search engines. We searched for the keywords ‘foresight’, ‘scenario’ and ‘futures’ since these terms were often used together and searched for these terms alongside the keywords ‘persona(s)’ and ‘design’.

After eliminating duplicate documents obtained from the two search engines, the publications were examined independently by the authors reading titles, keywords, and abstracts. The full-length publications were screened using the inclusion and exclusion criteria summarised in [Table 2](#). We narrowed the search to empirical cases that deployed personas with scenarios and eliminated theoretical or conceptual papers that would not help address the objectives of the study.

The search was not limited to topics about business strategy and consumer preferences; we were open to include publications that deployed personas across broad themes and initiatives including those addressing future societal challenges ([Salminen et al., 2022](#)). However, publications that had a purely design focus and concentrated on new product development in real-life scenarios were eliminated because these did not have a futures orientation e.g., studies addressing the use of personas in engineering and software design and marketing. Finally, 17 publications were selected that were coherent with the study’s objectives.

The analysis determined how personas are characterised, their role and scope of application in scenario building. As common topics emerged during the analysis, it was decided to synthesise the data according to the following three themes that constituted the analytical framework for the study:

- Persona as a *character* and the traits and representations of a persona
- Persona as a *function* and the role this fulfils in scenario building
- Persona as a *process* and how the persona is constructed

Topics and themes that emerged from the articles enriched the analysis and contributed to developing a nuanced understanding of persona characters and their use in scenario building. The authors also synthesised information about the sector/domain of application. We inputted the data into an excel sheet and went through several iterations between the data and the cases to agree on and refine the core themes. The use of the analytical framework to analyse the cases also ensured internal consistency in the analysis.

## 4. Results

In this section, we describe our findings from the analysis of the cases in relation to how personas are represented and their contribution to scenario building. [Table 3](#) summarises the results from the case studies analysed.

### 4.1. Persona representations – as characters, narratives, and artefacts

The cases analysed in this paper demonstrate a variety of formats and media through which personas are represented in scenarios. These include traditional formats such as digital or hand drawn illustrations ([Cherry et al., 2022](#)), and profile cards or fact sheets that draw from design thinking practice consisting of a picture and a summary description of archetype users (e.g., [De Moor et al., 2014](#); [Fergnani, 2019](#)). Art-based methods of different genres such as photography, collage, 3D artefacts, theatre, music, poetry, among others and/or their integration are proposed as new ways of representing personas ([Wolff et al., 2021](#)). In addition, the cases explore a range of other media that depict personas as digital artefacts ([Morrison & Chisin, 2017](#)), non-human characters (e.g., animals) and inanimate objects e.g., plastic bottles ([Farrow, 2021](#); [Neuhoff et al., 2022](#)).

The representation of personas as characters that interact with the physical, emotional, and cultural spaces adds a social and emotional dimension when developing future scenarios and visions. For example, [Marshall et al., \(2023\)](#) view personas as familiar characters that convey users’ emotions, including fears, frustrations, and expectations as well as their attitudes towards the future, establishing empathy and engagement with the audience. In so doing, personas expose futures in more direct, human and intuitive terms ([Fergnani, 2019](#)). Personas become a vehicle through which to interpret and re-interpret meaning, such as in [Morrison and Chisin \(2017\)](#)’s study on climate futures that used physical artefacts and an online blog as representations of personas. Thus, futures emerged as putative or as assumed or recognised possibilities rather than from a more precise methodology such as that used in scenario building and back-casting.

**Table 2**

Inclusion and exclusion criteria used in the search strategy.

Inclusion criteria	Exclusion criteria
Peer reviewed journal articles or conference papers	Articles in non-refereed journals were excluded from the study
Articles published in the English language	Strictly theoretical or conceptual papers
Articles that develop and/or use personas in an empirical study	Design studies that focus on new product development in a real-life or present-day scenarios
Articles from across a date range – the search was not limited to a specific timeframe	
Broad domains of application of personas in a foresight and futures context	

**Table 3**  
Characteristics and roles of personas in scenario building.

Authors	Publication	Topic/ Domain of the study	Findings related to characteristics of personas	Findings related to the roles of personas		
				Creative imagination	Communication	Sensemaking
Becker and Becker (2022)	Journal of Future Studies	Poverty-free futures	Narratives embodying emotions and values		Create rounded narratives of each scenario by placing social, economic, technological, and cultural dimensions into perspective Enrich the content of scenarios about future uses of electronic policing record systems	Sense make and understand scenario implications
Borglund and Öberg (2007)	The 30th Information Systems Research Seminar	Future digitalisation of policing services	Archetype users built as narratives, fictional characters			
Cherry et al., (2022)	Energy Research & Social Science	Sustainable energy futures	Illustrations embodying emotions and mindsets	Personas enable creative engagement with possible futures		Enable a 'contextualised evaluation' of implications of future change by drawing on present-day experiences
De Moor et al., (2014)	Futures	Future of digital and analogue television	Profile cards identifying tacit needs and expectations	Personas unlock the creative and imaginative potential of users exploring future TV experiences and interacting with digital and analogue technology	Provide rich insights on user needs and visions. Personas contribute to integrating multiple expectations	
Farrow (2021)	World Futures Review	Future of AI in strategic services management	Narratives embodying emotions, futures hopes and desires	Personas contribute to explore developments of AI in future organisational strategy		Contribute to a reflection and evaluation of the implications of AI on strategy
Fergnani (2019)	Foresight	Futures of work	Factsheets reflecting experiences in daily life		Personas enrich and humanise narration of scenarios and communicate the message about scenarios across an organisation	
Giunta et al., (2021)	Journal of Design for Social Change, Sustainable Innovation and Entrepreneurship	City futures	Profiles of characters portrayed in the future	Personas developed as 'postcards of the future' narrating a challenge for the future of the city looking towards 2040		
Marshall et al., (2023)	Futures	Futures of militarisation	Characters embodying motivations, fears and hopes		Communicate technology developments and define response strategies based on the characters' life histories and objectives	Contribute to illustrating responses to future scenarios through persona's lived experiences
Martin et al., (2021)	Congress of the International Ergonomics Association Springer International Publishing	Sustainable energy futures	Archetype user profiles	Stimulate creative imagination and idea generation about needs of precursory users	Develop rich representations of precursory user needs and activities	
Morrison and Chisin (2017)	The Design Journal	Climate change and sustainability futures	Physical and digital non-human artefacts, narratives			Explore and generate insights on complex topics engaging diverse publics, allowing multiple perspectives to emerge
Neuhoff et al., (2022)	The Design Journal	Sustainability futures	Human characters and inanimate objects reflecting emotions, hopes, fears	Imagine and envision sustainability futures	Communicate ideas about sustainability futures and how these are manifested in everyday life	Evaluate the impacts of scenarios by making these more empathic, personal and relatable

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Table 3 (continued)

Authors	Publication	Topic/ Domain of the study	Findings related to characteristics of personas	Findings related to the roles of personas		
				Creative imagination	Communication	Sensemaking
Richter and Döring (2015)	ICT4AgeingWell	Future of assistive service robots in healthcare	Profile cards of prototype users and user needs		Underline the benefits of normative scenarios using assisted robot technology	
Rosa et al., (2021)	Journal of Futures Research	Citizen foresight and innovation policy	Narratives, stories		Communicate scenarios to different target groups and facilitate deeper engagement of participants by making these relatable and demonstrating impacts in everyday life	Explore the impacts of scenarios on daily life behaviours, values and ethical frameworks
Sahakian et al., (2023)	Futures	Sustainable energy futures	Cartoons representing socio- demographic groups		Create relatable and engaging scenarios by presenting personas in visual and text form	Simplify complex issues by representing episodes of daily life and changes in social practices and activities characterising future narratives
Tori et al., (2023)	Transportation Research Interdisciplinary Perspectives	Mobility futures	Fictional characters of archetype users		Represent user experiences and behavioural patterns projecting these into the future	Evaluate the impacts of future transport and mobility scenarios on everyday life.
Vallet et al., (2020)	Futures	Urban mobility futures	User profiles of future travellers	Personas embody users' different preferences and expectations	Scenario-persona narratives communicate a 'futures' experience in alternative scenarios	Evaluate future impacts of transport developments by considering multiple user perspectives and anticipating user requirements for integrated mobility services
Wolff et al., (2021)	Conference on Human Factors in Computing Systems, New York, USA	Sustainable city design futures	Fictional characters journeying through time	Personas embody nature and the natural environment	Experience a scenario "directly" through enacting feelings, actions, and physical stimuli, creating a seventh sense linking the environment and nature	Assess the impacts of future solutions on the natural environment

#### 4.2. Roles of personas in scenario building

As part of the analysis, we considered how personas benefit scenarios and scenario building, and the roles personas fulfil in the process. For this purpose, we discuss three elements on the uses of personas that emerged from the analysis of the cases: fostering creative imagination, communicating futures and sensemaking futures. These are discussed below.

##### 4.2.1. Creative imagination

Miller (2024) prompts us to reflect on the role of personas in enabling the creative imagination of individuals participating in a scenario process. Imagining futures involves taking novelty into account in our perception of the present by formulating novel ideas or combinations of ideas and themes that funnel human imagining of the "not-past, not-present" (Miller, 2024 p. 123). In this context, the use of personas enables a reflection on the future through the perspective of different characters or artefacts, thereby contributing to defamiliarize norms of attention and representation, allowing normative epistemologies and assumptions to surface (Mangnus et al., 2021). Imagination also reframes how participants anticipate futures, by disrupting the "reproduction of the familiar" (Miller, 2024 p. 119), opening opportunities to explore new and creative elements in the present. This connects to embedding a futures awareness that gives "access to novel aspects of the present" (Miller, 2018 p. 23).

Indeed, exploring futures through multiple perspectives is a way to cope with future uncertainty. By highlighting the social, emotional and ethical dimensions of futures, personas foster a critical awareness on the implications of different future developments in the present. In the cases analysed, personas connect imagined worlds to the present embedding fictional characters in "daily life in a future time" (Rosa et al., 2021 p.3) or representing these as 'postcards' of a future to be realised (Giunta et al., 2021). This helps create immersive experiences by eliciting a "sense of presence" and of "being there in a simulated reality" (Woodgate, 2019 p.70), generating richer insights of future developments and their likely impacts on individuals, communities and other stakeholders. In this context,

personas are used as proxies of the future “encouraging a more playful and creative engagement with potential futures, providing the space to gradually incorporate situated experiences and relationships into the process of character development” (Cherry et al., 2022 p.4).

#### 4.2.2. Communicating future scenarios

A compelling aspect of personas is that these tease salient information about futures in a vivid manner (Becker & Becker, 2022; Fergnani, 2019; Tori et al., 2023). Of the studies analysed, the vast majority utilise personas to develop rich descriptions of scenarios by contextualising the scenarios and describing the behaviours and actions of personas (as archetype users) inhabiting future worlds. For example, Rosa et al. (2021 p.4) create personas as “personalised narratives that animate the future” to communicate scenarios to different target groups. The persona approach offers a way to build futures that are relatable, what Lambert et al. (2024) refer to as “futures empathy” (p. 10). This by allowing participants to experience fragments of a future world to then elaborate on how this resonates in the present (Lambert et al., 2024; Neuhoff et al., 2022).

Fergnani (2019) proposes developing scenario-specific future personas i.e., characters with specific attributes that mirror the different future worlds they live in; whereas Vallet et al. (2020) build multiple personas representing future travellers and explore how each relates to different scenarios on the future of urban mobility. Personas may reflect the concerns and conflicts that arise between present day characters and future (technological) worlds. For example, in their study on sustainable energy futures, Cherry et al. (2022) utilise personas to bring to light potential areas of controversy in energy system transitions, communicating issues that matter to local communities such as those relating to social justice and governance of energy futures.

#### 4.2.3. Sensemaking futures

Prospective sensemaking in foresight involves assigning meaning to futures and clarifying the implications of future events that may be novel to the organisation (Sakellariou & Vecchiato, 2022). The persona approach, alongside other foresight practices such as horizon scanning, workshops and storytelling facilitates sensemaking by creating rich and detailed representations of futures and contextualising futures within the lived realities of individuals and organisations. In practice, personas help simplify complex issues by interpreting future developments through real-life experiences (Sahakian et al., 2023; Tori et al., 2023). For example, by exploring the possible ‘positive’ and ‘negative’ impacts of different futures on local communities (De Moor et al., 2014).

Modelling personas on episodes of daily life behaviours, social practices, and ethical frameworks (Rosa et al., 2021; Sahakian et al., 2023) introduces several cognitive biases when making judgements about the future. This is because personas are shaped by individual world views and “embedded myths” that influence their characteristics and behaviours in different futures (Farrow, 2021 p.229). Arguably, persona-based explorations envision futures that are anchored to past experiences, or that focus on instances from recent memory (Liveley et al., 2021; Schirrmeister et al., 2020) to then converge towards shared projections or images of the future (Rohrbeck et al., 2015; Stingl & Geraldi, 2023). Despite this, Marshall et al., (2023) consider personas to be ‘profoundly powerful’ in reflecting stakeholders’ individual values and motivations and in exerting agency in shaping futures. This also draws attention to the power influences at play in a scenario process in terms of how stakeholders interpret what can be known about the future and the possible pathways for action (Mangnus et al., 2021, Stirling, 2008). We elaborate on these topics in the following section that discusses the potential and limitations of employing personas in foresight and futures studies.

## 5. Perspectives on integrating personas in scenario building

The challenge of constructing personas in the scenario process is that of integrating imaginative and participatory elements, while projecting personas into a future that has yet to be realised. In a design context, designers rely on user data to build personas, by combining insights from market trends and data collected from lead users at the forefront of innovation (De Moor et al., 2014). Additionally, insights are obtained from precursory users, which Martin et al. (2021), define as users that experience future needs and activities ahead of typical customers or end users. This approach may somewhat limit the use of personas in the scenario process and futures more generally, since it perpetuates current patterns of thinking and biases, grounding the future in past events (Lambert et al., 2024; Fergnani, 2019). Indeed, some of the analysed cases acknowledge these biases, delineating personas as protagonists of future events that unravel from the past and present and lead into the future (e.g., Cherry et al., 2022; Fergnani, 2019; Neuhoff et al., 2022; Vallet et al., 2020). Design practice attempts to mitigate the cognitive biases that arise early in the scenario process when future projections are generated (Schirrmeister et al., 2020). This by immersing participants in diverse unfamiliar contexts (Liedtka, 2015) beyond “what is easy to recall in order to build new future directions” (Lambert et al., 2024 p.2). For example, personas are deployed alongside other design tools such as storytelling and narratives (Marshall et al., 2023; Vallet et al., 2020) and futures design experiments (Neuhoff et al., 2022) to engage participants in building immersive futures.

Co-creating personas is a relational experience, that engages stakeholders – these are participants in the scenario process, facilitators and designers – with a medium e.g., narrative, scenario, visual artefact etc., (Liveley et al., 2021). In most of the cases analysed, personas were co-created with users, such as citizens (Cherry et al., 2022; Rosa et al., 2021) and community stakeholders (Giunta et al., 2021), using tools such as role play, art, and prototyping (Wolff et al., 2021). Through role-play, participants enact different futures within which to experience ‘the lives of others’ and empathise with future developments (Lambert et al., 2024; Marshall et al., 2023). For example, Farrow (2021)’s study on the transformative role of artificial intelligence (AI) in service design, develops AI as a persona with ‘non-human’ attributes capable of shaping decisions about future technological transformation. As such, by dehumanising personas, the participants were able to correct for personal biases about the possible negative implications of future technology developments on organisational strategy. Becker and Becker (2022) describe how personas evolved with time in different stages of the

visioning process enabling a free flow of ideas that challenged the participants' underlying metaphors and assumptions allowing for persona characters' worldviews to emerge. In a futures context, personas are not simply characters in a story; they are integrated into the plot as essential elements of the future narrative (e.g., the 'persona-scenario' narratives described by Vallet et al., 2020). Thus, the persona aims to reveal new contexts, and hidden insights or unrecognised future needs. In the process, participants are "testing the boundaries of self against those of another" (Liveley et al., 2021 p.5) gaining insights and cues of previously uncharted paths and territories. This is not to say that participants are completely divested of the biases that anchor their perspective of the future to lived experiences and histories. Speculative design creates a possibility space where participants, through the behaviours and actions enacted by personas, can take bolder steps to experiment with new ideas, surprises and challenges while also considering the risks associated with different future scenarios (e.g., Borglund & Öberg, 2007).

Adding personas to a scenario process introduces an element of stakeholder agency "by making explicit different perspectives of the scenario" and the multiple framings and worldviews on a specific challenge or problem (Rutting et al., 2024 p.9). On the one hand, the persona method enables stakeholders to engage with different subjectivities and emotions that together contribute to envisioning alternative futures (Liveley et al., 2021 p.4). It gives ground to the idea that there are different collectively held imaginaries or shared visions of the future that can be elaborated and negotiated through the personas in the scenario process (Rutting et al., 2024). On the other hand, using co-design and participatory approaches to create personas raises important issues on power dynamics among participants and how powerful incumbents' interests and value-systems could influence both the design process and its outcome (Mangnus et al., 2021; Stirling, 2008). This can be reflected in conflicts of interests that may arise, or in the hidden omission of possible alternatives that could narrow down choices and agendas in favour of more powerful parties' interests (Farr, 2018). Therefore, co-creating future personas and scenarios can be seen as a negotiation process: as participants make decisions about which elements trigger changes in others, they also implicitly determine who will benefit from these adjustments in the imagined future and who will need to adapt (Schulz-Schaeffer & Meister, 2019). This underscores the importance of interpreting the process of building, specifying, and evaluating scenarios and personas living the scenarios as a negotiation of power and interests where different stakeholders collaboratively shape outcomes that reflect collective perspectives (Mangnus et al., 2021).

## 6. Recommendations

Designers and foresight practitioners involved in scenario building can potentially tap into a vast toolbox of methods and approaches to explore possible future scenarios. Why use personas? The persona approach is versatile in terms of the representation of different persona characters and the approaches used to construct personas that can incorporate participant engagement and co-creation. Table 4 links the characteristics of persona and their design features to their roles in scenario building. In this section, we provide suggestions on how to integrate personas in the scenario process.

The persona method can be readily adapted by organisations involved in the scenario process and foresight. Foresight and design practitioners could select which dimensions of the persona approach to use in the scenario process:

- *Design-features*: The diverse characters and forms used to represent personas encourage creative imagination and exploring futures from multiple perspectives.

**Table 4**

Comparison of the characteristics, roles, and construction of personas in design thinking and scenario building.

Dimension	Personas in Design Thinking	Personas in Scenario building
<b>Persona characteristics</b>	<ul style="list-style-type: none"> <li>• Profile card with representative image, fictitious name, demographics, attitude quotes, and detailed persona information.</li> </ul>	<ul style="list-style-type: none"> <li>• Represented using different formats and media: Physical and digital artefacts (e.g., sculptures, blogs)</li> <li>• Non-human characters (e.g., animals) and inanimate objects (e.g. plastic bottles).</li> <li>• Digital and hand drawing illustrations.</li> <li>• Profile cards with picture and summary description.</li> <li>• Art-based representation (e.g., photography, collage, 3D artefacts, theatre, music) to build empathy.</li> <li>• Storytelling and narrative, both written and complemented with visuals and cartoons.</li> </ul>
<b>Roles</b>	<ul style="list-style-type: none"> <li>• Deeply understanding human behaviours and needs</li> <li>• Communicating users' needs and expectations</li> <li>• Assisting individuals in decision-making throughout the design process</li> </ul>	<ul style="list-style-type: none"> <li>• Fostering creative imagination, facilitating personal immersion in future scenarios and impersonating different roles generating richer insights of future developments.</li> <li>• Communicating future scenarios to different stakeholders developing a rich description of behaviours and actions of archetype users inhabiting future worlds.</li> <li>• Sensemaking futures; clarifying the implications of future events through real-life experiences.</li> </ul>
<b>Construction of personas</b>	<ul style="list-style-type: none"> <li>• Rigorous data collection through qualitative and/or quantitative user analysis and ethnographic research.</li> <li>• Domain expert interviews, linked to evidence and data.</li> <li>• Integration of market trends and data collected from lead users and precursory users.</li> </ul>	<ul style="list-style-type: none"> <li>• Integration of market trends and data collected from lead users and precursory users.</li> <li>• Co-creation process involving experts, end users, community stakeholders and the research/design team.</li> </ul>

- **Roles:** The roles of personas in communication and sensemaking contribute to evaluating future impacts and to decision-making.
- **Construction/design:** The co-creation of personas with participants of a scenario process facilitates engagement with future scenarios.

Representing personas as artefacts using different media can benefit how future scenarios are communicated to users (Braun et al., 2024; Morrison & Chisin, 2017; Neuhoff et al., 2022). Another potential area that designers could explore is to construct personas from available fiction. Bleecker (2022) introduced the term design fiction as a speculative design method that uses fictional scenarios, prototypes, or narratives to explore potential futures. This concept has been characterised as a speculative design method that utilises future-focused prototypes (Coulton et al., 2016), which integrates storytelling and places emphasis on incorporating personas to make scenarios more accessible. It has been argued in the context of foresight that narratives from popular culture, such as science fiction, support not only understanding futures but can also have a profound influence on how the future is imagined by individuals (Schwarz, 2015). Therefore, it could be promising to incorporate well-known persona characters from novels and movies into scenarios to create stronger identification with the scenarios. For example, Braun et al., (2024) have found evidence supporting the positive influence of incorporating literary works, such as novels and film, in futures thinking. Incorporating personas from fiction into scenarios could therefore have a similar effect.

Engaging stakeholders in scenario building is driven by a motivation to create an inclusive process that reflects diverse stakeholder interests and perspectives (Andersen & Silvast, 2023). To this end, broader stakeholder groups are included to “open up decision-making to alternative and potentially transformational ideas” (Rutting et al., 2024, p.10). A participatory process is not designed to include all “active users” (Andersen & Silvast, 2023 p. 7). However, the questions of who should be involved in a scenario process and the methods and approaches to engage participants remain open for debate (Silstav, 2023). In the cases we analysed, the participants were those who could affect the scenarios (such as the client commissioning the study and experts) as well as others indirectly impacted by their outcomes (e.g., public authorities, civil society organisations and lay citizens). Additionally, the scenario process involved designers who were consultants engaged by the client, or they were futures practitioners who designed the personas or facilitated their co-construction.

The capability to design personas - through collecting information, consulting experts, creating the artefacts and the future projections - rests with designers and foresight practitioners working for the sponsor or client, in line with the project’s objectives. Designers and foresight practitioners frequently invest significant effort in refining personas and scenarios through consultations with experts and other stakeholders (e.g., Sahakian et al., 2023). They play a pivotal role in the scenario process because of their ability to engage and empower participants, but also by intervening at different stages in the creation and implementation of scenarios (Schirmeister et al., 2020). Similarly, stakeholders involved in co-designing personas may unconsciously privilege certain perspectives - those aligned with dominant societal imaginaries i.e., institutionally endorsed and collectively envisioned representations of the future - while marginalizing others, such as those from underrepresented or non-Western contexts (Rutting et al., 2024). However, this approach could narrow down the range of perspectives or favour incumbent interests (Stirling, 2008). It also prompts a consideration of which stakeholder group contributes the most and which benefits the most in shaping future perspectives, highlighting power imbalances within the participatory process.

Training facilitators to adopt a reflexive approach when designing and constructing futures, allows for the inclusion of diverse, often underrepresented perspectives by challenging dominant narratives, helping to deconstruct the power dynamics rooted in societal imaginaries (Mangnus et al., 2021; Schirmeister et al., 2020). This could in part be achieved through planned efforts to integrate persona characters that reflect the concerns and aspirations of diverse stakeholders and their underlying “perspectives, assumptions, beliefs, values and political motives” (Rutting et al., 2024 p. 2). For example, those of marginalised groups or otherwise underrepresented stakeholders that are not routinely included in scenario processes (e.g., indigenous communities). Additionally, the portrayal of personas as villains or ‘anti-heroes’ is often overlooked. This perspective offers valuable insights into the tensions and conflicts that arise when different values and normative understandings collide. Furthermore, designers and foresight practitioners should give greater consideration to how language and diverse cultural identities shape the representation of personas and the perception of their behaviours in different future scenarios.

Bonaccorsi et al. (2020) highlight how the initial framing of a challenge or problem influences the participants’ reactions and responses to future scenarios, describing this as another type of cognitive bias. For example, in Vallet et al. (2020)’s study, participants explore the behaviours of persona characters ‘living’ inside futures drafted by experts and influenced by experts’ domain knowledge and expectations on the issues to be examined. To mitigate this framing bias, designers and foresight practitioners are encouraged to involve stakeholders in co-designing personas early on, in the development of the scenarios rather than present these with a set of pre-defined scenarios (Fergnani, 2019). This is evident in the approach adopted by Marshall et al. (2023), where participants were allowed time to develop the personas as the scenario narratives unfolded.

Multidisciplinary teams that integrate expert and non-expert opinion help to mitigate cognitive biases by balancing individual opinions and questioning personal norms and beliefs (Bonaccorsi et al., 2020; Liedtka, 2015). Working in small groups on different persona characters using various design tools (such as role play, art and narrative) and different media helps to immerse participants into distant futures, triggering their creative imagination (Braun et al., 2024). The persona approach could be adapted to make explicit the power dynamics among stakeholder groups (Rutting et al., 2024). For example, through role play, and the personification of fictional characters, stakeholders negotiate across power structures and normative understandings, and the different interests, priorities and values that are at stake. Participants in a scenario process must be given space to reflect on how their own assumptions, influenced by societal imaginaries, impact decisions about which personas are prioritized and pushed forward.

## 7. Conclusion, implications, and limitations

The integration of human-centred design approaches, such as personas in the foresight and futures field opens an opportunity to construct insightful, immersive, and visual representations of futures filled with detail and context, creating futures that are more comprehensible and meaningful (Fergnani, 2019). Personas, whether as artefacts within a future narrative or as essential components in constructing it, contribute to eliciting emotional responses to futures that are not directly experienced. In this context, the significance of design approaches including personas, alongside design fiction and speculative design, lies in integrating ‘experientially augmented toolsets’ in foresight and futures, which utilize creative imagination to engage participants in creating experiential futures (Candy and Dunagan, 2017). Characterising personas through different media, such as through art and literature or film, and other visual representations e.g., cartoons that trigger sensory experiences, could help refine the role of personas in building experiential futures and provide deeper insights into how participants form emotional connections with the futures they are exploring (Braun et al., 2024).

We highlight the importance of reflexivity in design practice and in the foresight and futures field. Future research could explore the use of personas in enhancing reflexivity in scenario building by shedding light on how stakeholders challenge dominant narratives, value systems, and power structures whilst engaging with the future through the lives of different persona characters (Andersen & Silvast, 2023; Rutting et al., 2024). The representations of different voices and practices through personas, makes scenario building not simply more inclusive but also more actionable across disciplines and communities. Future work could explore the use of personas in making explicit the power dynamics at play when building future scenarios, by creating visual representations of who is represented and who is excluded when taking decisions about the future. This to avoid reinforcing pre-established assumptions, interests, or configurations of power that “close down” (Stirling, 2008) the range of futures options. Marshall et al. (2023) recommend using personas not merely as illustrations to enliven future scenarios but as fulfilling a decision-making role in interpreting futures through different cognitive lenses. Through the lens of personas, stakeholders can cultivate a deeper awareness of the implications of their choices, leading to more informed futures (Mangnus et al., 2021). Thus, personas contribute to developing conscious anticipation and proactive decision-making (Miller, 2018), enabling stakeholders to navigate future uncertainties with greater confidence.

In this paper, we link persona characteristics and design features to their roles in scenario building, allowing practitioners flexibility to experiment with different approaches to design personas tailored to different contexts (e.g., corporate and government foresight contexts and grassroots projects). The main implication for practitioners involved in design, foresight and planning is the importance of developing insights about future users and their expectations, exploring inter alia the unexpected or unanticipated forms of use, moving beyond present-day user needs. There are several other questions to explore both from a foresight and design practitioner’s perspective. For example, regarding the skills needed to work in multidisciplinary teams to co-create personas and the steps to integrate personas in a foresight or futures context. Also, we have limited our investigation to the application of personas in the process of scenario building. Further work that builds on and adapts the personas approach in other aspects of foresight e.g., prospecting, perceiving, probing, and transforming (Schwarz, 2023) is an area for further investigation.

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**Carmen Bruno:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Lisa A. Pace:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Data curation, Conceptualization. **Jan Oliver Schwarz:** Writing – review & editing, Writing – original draft, Formal analysis.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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