

9 Delphi method

Reaching consensus on workplace performance

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9.1 Background

Delphi is a tool for negotiation through a ‘structured communication process’. It is not a new method, but its application in workplace research and management is far from established. This chapter presents the method and argues that workplace studies would benefit from adopting it, especially in the new era (see the Preface of this handbook).

Delphi pursues the goal to reach stability in opinions (not necessarily consensus) on an issue that can range from the qualitative identification of factors entailing a certain event to the extraction of quantitative or semi-quantitative data in a knowledge area where no data exist, yet.

[Delphi] is intended for use in judgment and forecasting situations in which pure model-based statistical methods are not practical or possible because of the lack of appropriate historical/economic/technical data and thus where some form of human judgmental input is necessary.

(Rowe & Wright, 1999, p. 354)

The method is based on the principle that a group of people can reach a ‘better’ decision through an effective communication process than any single member acting alone (Linstone & Turoff, 2011). Delphi is contemplated among expert-based futures methods (Marchais-Roubelat & Roubelat, 2011) and Group Decision Support Systems (Linstone & Turoff, 2011), and it is rooted in the general theory of consistency (Kuusi, 1999). Its name definitely relates to the Delphic Oracle, being at stake the search for knowledge that is not available by other rational means through some sort of ritual (Linstone & Turoff, 2002; Marchais-Roubelat & Roubelat, 2011).

Even though Delphi can be defined as a popular and relatively well-established approach, it is not exempt from criticism. Harsh claims on the method, considering it undefined, unreliable, and poor in scientific reliability (e.g. Sackman, 1975), hindered its broad adoption until the last decade of the past century. Most likely because it misses a strict scientific procedure, sceptics of Delphi criticise it for being more of a political than a research tool (Goldschmidt, 1975). Supporters, on

the contrary, acknowledge its value to approach areas that are challenging to inquire with traditional scientific methods, last but not least futures analysis (Helmer, 1967; Kuusi, 1999).

One can find Delphi described from time to time as a ‘study’, a ‘method’, a ‘research’, a ‘process’, a ‘methodology’, an ‘approach’, a ‘technique’, a ‘survey’, a ‘concept’, an ‘application’, an ‘inquiry’, a ‘panel’, a ‘consultation’, an ‘investigation’, and more (Mullen, 2003). Linstone and Turoff (2002, p. 3) say that “in its design and use Delphi is more of an art than a science”. There is no one ‘true’ Delphi. On the contrary, over-prescription is considered dangerous in Delphi applications because it will narrow its scope and inhibit its versatility (Mullen, 2003).

The Delphi process develops via an alternation of anonymous and deliberate expressions of opinions by an ‘expert’ panel. Usually, this entails an iterative process of sending a questionnaire to a few experts, collating the responses often accompanied by extended explanations or justifications, and resending the questionnaire, which is the same or a revised version of the original one. The second and following questionnaire submissions are frequently supplemented by a summary and elaboration of the previous responses so that the participant can reconsider his/her opinion according to the others’ and, if needed, revise his/her answers based on the insights garnered from other experts.

The first record of the Delphi concept dates back to 1951 when an Air Force-sponsored RAND Corporation study employed this technique to apply expert opinion “to the selection, from the point of view of a Soviet strategic planner, of an optimal U.S. industrial target system and to the estimation of the number of A-bombs required to reduce the munitions output by a prescribed amount” (Dalkey & Helmer, 1962, p. 1). Apart from its original application in defence research, Delphi has been adopted since the 1950s for technological forecasting. Through the 1960s and 1970s, it has found fortune in healthcare and medical applications, including nursing (Mullen, 2003). Many early studies applied this technique for long-term forecasting. However, with the publication of Linstone and Turoff’s (1975) edited book on Delphi, a wider audience became aware of it and started employing it in multiple domains and for different purposes (Rowe & Wright, 2011). Contributions employing a Delphi approach flourished especially throughout the 1990s. About ten years ago, the journal *Technological Forecasting and Social Change* dedicated a special issue to the Delphi technique. More recently, Delphi has also been applied in the construction and real estate sector and has spread across different geographical areas. Some of the latest studies in this field adopt Delphi to detect critical success factors of urban renewal projects in China (Chen et al., 2022); to assess the modern architectural heritage in India (Gayen et al., 2022); to determine influential indicators for office real estate price modelling in Nigeria (Yakub et al., 2022); and to develop a design quality indicators toolkit for campus facilities (Hasanain et al., 2022). It is evident that the method has had many variations to adapt to different circumstances and aims (Puglisi, 2001). In the construction and real estate sector, this technique is mostly used to create consensus on relevant variables that are likely to unfold their impact sometime in the future.

Delphi has already been used in multiple cases for what concerns the office environment. Becker and his collaborators employ Delphi in the development of the ORBIT¹ rating process (Becker, 1990). Hinks and McNay (1999) adopt the same type of study to extrapolate a bespoke set of key indicators (KPIs) for facilities management performance assessment. They describe the method as a consultative research technique, designed to merge different opinions where there is a lack of agreed knowledge. The method was also used to discover and describe new trends and their implications for the future of the office by combining the human resource, information technology, corporate real estate, and facility management perspectives and setting a common agenda of issues to address in the future workplace (De Bruyne & Gerritse, 2018). More recently, a virtual survey employing a Delphi method was launched by the International Facility Management Association (IFMA) through their latest Survey “The Experts’ Assessment: New Ways of Working (NWow) towards 2030”.² The survey is in a real-time Delphi format that enables the respondents not only to answer questions – mostly based on Likert scales, but also to explain the reasoning behind their answers, and compare the responses to other experts instantaneously.

9.2 Argument

Futures studies techniques have been gaining increasing attention among scholars and industry professionals in the workplace. For instance, the Royal Society for the encouragement of Arts, Manufactures, and Commerce (RSA, 2019) and Johnson Controls (Ratcliffe & Saurin, 2008) have recently sponsored the employment of futures techniques to project and imagine likely workplace scenarios for the years to come. Among future studies, though, the application of Delphi in the workplace realm is still scattered besides the examples mentioned above. There are several reasons why it would make sense to adopt this method more extensively. Linstone and Turoff (1975, p. 4), in their seminal book on the Delphi method, state that the need for employing a Delphi emerges when:

- *The problem does not lend itself to precise analytical techniques but can benefit from subjective judgements on a collective basis.*
- *The individuals needed to contribute to the examination of a broad or complex problem have no history of adequate communication and may represent diverse backgrounds with respect to experience or expertise.*
- *More individuals are needed that can effectively interact in a face-to-face exchange.*
- *Time and cost make frequent group meetings infeasible.*
- *A supplemental group communication process can increase the efficiency of face-to-face meetings.*
- *Disagreements among individuals are so severe or politically unpalatable that the communication process must be referred and/or anonymity assured.*

- *The heterogeneity of the participants must be preserved to assure validity of the results, i.e. avoidance of domination by quantity or by strength of personality ('bandwagon effect').*

In fact, many of these elements are present in contemporary workplaces. Understanding workplace matters, especially in times of deep uncertainty and change as the present ones, is (1) becoming increasingly complex, (2) involving a wider range of stakeholders in 'direct-democracy' mechanisms, (3) developing into a cross-disciplinary area of inquiry, and (4) requiring the ability to project future scenarios (De Bruyne & Gerritse, 2018).

- 1 What seems to strongly differentiate today's work and work processes from the past is the nature, extent, and speed of change (De Bruyne & Gerritse, 2018; Kaplan & Aronoff, 1996; McGregor, 2000), which makes the world of work increasingly flexible and complex to manage. Delphi was described by Linstone and Turoff (1975, p. 3) as a method for structuring group communication so that "the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem". The difficulty of managing an overwhelming knowledge load progressively led to delegation and separation of the roles.

When organizations were small, the head of the organization was able to know virtually all the information needed to run the business. As organizations grew and became more complex, a single individual could not carry the entire knowledge load. Managers and specialists were added to the organization [...].

(Kaplan & Aronoff, 1996, p. 9)

This dynamic has probably contributed to the dispersion affecting today's knowledge across different corporate departments. Therefore, engaging a growing number of actors in workplace change and related processes is necessary.

- 2 Workplace data are generally retained by different departments, each with its focus and lexicon (Jordan et al., 2009) according to their respective stakes, and tend to be kept separate. Chief Executive Officers (CEOs) look at growth and competitive advantage, checking for incremental revenue, speed-to-market, etc. Chief Financial Officers (CFOs) control costs and financial impacts, observing Return On Investment (ROI), occupancy costs, lease flexibility, and so on. Chief Operating Officers (COOs) are in charge of operational efficiency, therefore look at schedules, work order productivity, and space utilization. Facility Managers (FMs) deal with the building, its physical features, and related complaints. Human Resources Managers (HRMs) take care of workers' attitudes, retention and attraction, absenteeism, medical costs, and so on. All these data are rarely cross-checked among those responsible for data gathering, nor "shared widely within organizations and almost certainly not evaluated against the kinds of spaces workers occupy" (World Green Building Council, 2014, p. 62). Surveys show that only 40% of Corporate Real Estate Managers (CREM) collaborate with other business functions (i.e. HR, IT, and finance) on a regular basis (Bouri

- et al., 2008). On the contrary, integration between various areas of the business should be encouraged (Amaratunga & Baldry, 2003). Moreover, workplace users include diverse individuals sharing space, time, and activities while expressing multiple and often divergent needs, among whom are employees, colleagues, customers, visitors, other stakeholders, and the company's brand (Puybaraud, 2017). It becomes clear that all these separate needs must be considered when trying to assess the efficacy of certain workplace solutions. In this context, Delphi may be the right tool to bring together, compare and contrast multiple stakes, and encourage a convergence of opinions that can be expected through the application of this approach (Helmer, 1967).
- 3 With the multiplication of stakes at play, workplace research comes from a broad range of disciplines, such as architecture, real estate, sociology, psychology, education, and others, that would benefit from being integrated (Kämpf-Dern & Konkol, 2017). Workplace professionals, as well, are required to master a range of competencies that belong either to ergonomics, environmental psychology, facility management, logistics, engineering, sustainability, and indoor environments. These capabilities are ideally all integrated into the background knowledge of the expertise in corporate real estate (Appel-Meulenbroek, 2014). The various fields herewith implicated complicate the spectrum and have discouraged research from an interdisciplinary strand (Fleming, 2004) and practice from establishing collaborative relationships (Duffy, 2000). That is why, the application of the Delphi method is suitable to support the development of a holistic view of the workplace (e.g. Fleming, 2004; Lavy et al., 2010; Haworth, 2016) through the merge of complementary perspectives, such as those carried by different workplace 'experts' that can cross-pollinate each other's experiences by being all involved in the iterative Delphi process.
 - 4 Finally, the volatility, uncertainty, complexity, and ambiguity of the work environment, and of the real estate market more broadly, call for professionals that can look further in time to endorse wanted futures and avoid unwanted ones (Karjalainen et al., 2022; Saurin et al., 2008; Toivonen, 2021). Especially in the wake of the COVID-19 pandemic, most of the assumptions that seemed established in the workplace realm have been strongly challenged. Part of the effort now should be to acknowledge what new workplace factors mainly affect businesses besides the more traditional physical and human dimensions, including the virtual dimension of work. This approach requires the ability to foresee future scenarios and create visions that anticipate the coming trends and new habits of the workforce. This cannot be possible via methods other than futures methods and decision support systems.

With all that said, applying a Delphi method in workplace research and practice has the potential to involve a range of ideas and to identify a shared view on what kind of future the world of work can expect and how the related space should be managed to adapt to it progressively. In the following section, an example will be shown, demonstrating Delphi's suitability for such scopes.

9.3 Example of application/use

The experience presented in this section was carried out as part of my PhD research (Tagliaro, 2018). The study's overarching aim was to bring together multiple perspectives on workplace impacts on people and organizations. Four companies collaborated in the study using it as an advisory work to enhance their respective workplace strategies. Through the application of Delphi, the goal was to elaborate a framework of Key Performance Indicators (KPIs) suitable to monitor the extent to which workplaces were impacting organizations' needs and, ultimately, for supporting workplace management. In this case, Delphi was adopted primarily to bring workplace 'experts' to agree on meaningful KPIs for improving current workplace management practices and anticipation of future workplace strategies.

Organizations have realized that their development strongly depends on the building they occupy (Lavy et al., 2010) and the workplace is an important part of their identity (De Bruyne & Gerritse, 2018). Nevertheless, corporate leaders often underestimate their workplaces' strategic potential and real estate assets (Duffy, 2000; Lindholm & Leväinen, 2006). In addition, they miss the right tools to assess those impacts; therefore, information, when existing, is lost or remains underutilized. 52% of real estate executives is reported saying that "the lack of data and analytics to measure value and generate insights holds them back from enhancing strategic value-add to their organizations" (JLL, 2017). The current state of the practice is affected by several other drawbacks: traditional real estate metrics are considered inadequate across a complex real estate portfolio; stakeholders are demanding, but often not familiar with metrics and results; and executives have to choose among a large variety of data points to gauge performance (JLL, 2017). Also, there is still a need to go beyond mere quantitative data and identify value-adding elements for organizations.

Based on these premises, the research and consultancy experience herewith described employed Delphi to develop a framework of indicators, meaningful to a wide group of workplace users and useful to control the impact and value of the workplace. In fact, impact evaluation is common to many different fields (e.g. policy-making) where Delphi has been widely adopted to inform judgement and decisions.

In this specific application, Delphi follows the form of a '*Delphi Exercise*' (Linstone & Turoff, 1975, p. 5). The process theoretically covers four phases: (1) exploration of the subject; (2) achievement of an understanding of how the group views the issue; (3) when there is significant disagreement, evaluation of the reasons for different opinions; and (4) synthesis of the analyses and considerations. In this case, the four phases have been contracted into three stages for easiness of employment, by taking inspiration from Hinks and McNay (1999), namely: an exploration of the subject (1) was performed with one first questionnaire; focus groups or interviews addressed both the discussion on group view (2) and the reasons for different opinions (3); and one final questionnaire was employed for synthesis (4). This particular application took inspiration from the EFTE (Estimate, Feedback, Talk, Estimate) approach, which includes open debate phases in different rounds (see Puglisi, 2001). Below these different stages will be described in detail.

9.3.1 The setting of the study

Before starting the Delphi, some preparation was necessary, on the one hand, to identify the panel of experts and to become familiar with them and, on the other hand, to organize the KPIs to be discussed throughout the process.

- 1 *Preparation.* This phase entailed KPI scouting, analysis, and systematization. A broad literature review was conducted to match indicators from the scientific literature with indicators from evaluation and rating tools. Finally, a list of 169 items was compiled (after appropriate selection and cleaning of a broader list). These were organized into nine thematic categories (i.e. environmental quality, building operation and management, space usage, business effectiveness, costs, value/return/yield, productivity/ways of working, user attitude, and staff characteristics) and three classes of impact/value (i.e. organizational, environmental, and social) – see [Table 9.1](#). Despite work to avoid redundancy, the long list still contained a few similar indicators. This was functional to stimulate the group discussion and come up with the most suitable indicator among similar choices.
- 2 *Selection of the case companies.* The experts were recruited from four different companies identified by convenience sampling with the following criteria:
 - Medium-large sized companies (500 employees or more), headquartered in Italy. This was functional to guarantee a reasonable complexity of the organizational and managerial structure along with similar cultural background, and to avoid language issues.
 - Industry diversity within knowledge-based organizations. A pharmaceutical, a utility, an automation technology, and an insurance company were invited in order to assure different approaches to business problems.
 - Companies that have renewed their premises or moved to new premises in recent times (less than five years) or are going to do it within the next five years. This to make sure that they were sufficiently familiar with the new ways of working and demonstrated an interest in aligning their workplace with organization needs. In the end, the sample of four companies comprised two that had already gone through a workplace change and two that, at the moment of the study, were preparing for an imminent change.

Table 9.1 Categories of indicators by classes of impact

<i>Class – Impact – Value</i>		
<i>Economic-financial/organizational</i>	<i>Environmental</i>	<i>Social</i>
Cost	Building operation and management	Productivity/Ways of Working
Value/Return/Yield	Environmental quality	User attitude
Business effectiveness	Space usage	Staff characteristics

- 3 *Getting familiar with the sample.* Before Delphi administration, the researcher got acquainted with each company's culture and experience with workplace management and change. This step was undertaken through semi-structured interviews with a few representatives in each company. These encounters explored the current workplace strategies and verified the degree of familiarity with performance assessment techniques at a corporate level. Besides, these dialogues were used to grasp suggestions for innovative KPIs and potentially expand the 169-item list. Finally, the best modalities to perform the Delphi research in each organization were arranged through these meetings.
- 4 *Identification of the expert panel.* Experts in this case were considered all the people who have a direct experience of the workplace in the different organizations and who have a different level of engagement with the management process. Ten user categories were identified in a previous research phase: CEO/owner/president, financial admin, CREM, FM, HRM, Engineering and space planning, IT, executives and managers, employees, and consultants/collaborators/interns. At least one representative of each category was to be included in the expert group. Their nomination happened thanks to direct contacts in the companies. A total of 40 participants composed the initial group, though some people progressively dropped participation during the process (Table 9.2). The following Delphi stages were performed separately in each company, namely in four groups of (about) ten people each.

9.3.2 *Exploration of the subject*

A first online questionnaire was prepared and administered to all 40 participants to get accustomed to the subject and start making their choices. The participants received the list of KPIs divided into the nine thematic categories and were asked to anonymously evaluate the level of importance of each indicator by stating whether they thought it was 'essential', only 'desirable', or of 'tertiary level importance'.

Table 9.2 Number of participants in the subsequent Delphi stages by expert categories

	<i>Questionnaire 1</i>	<i>Interviews/ Focus groups</i>	<i>Questionnaire 2</i>
Expert categories	Total	Total	Total
Consultant/Collaborator/Internee	5	4	4
Corporate Real Estate Management	4	4	2
Designer/architect/engineer	4	3	2
Employee/clerical in other department	4	3	3
Facility Management	3	2	1
Human Resources Management	4	4	3
ICT Department	3	3	4
Manager in other department	5	4	3
Office Financial Administration	3	3	2
Owner/President/CEO	4	3	1
Total number of participants	39	33	25

Table 9.3 KPIs in the initial list vs. KPIs after Questionnaire 1

KPI category	KPIs in the initial list		KPIs in the list after Questionnaire 1		
	Number	%	Number	%	Sum of votes
Building operation and management	34	20%	11	26%	314
Environmental quality	9	5%	9	21%	299
Productivity/Ways of Working	34	21%	5	12%	126
User attitude	16	9%	5	12%	123
Staff characteristics	13	8%	5	12%	113
Space usage	10	6%	4	9%	87
Business effectiveness	18	11%	3	7%	71
Costs	24	14%	1	2%	29
Value/Return/Yield	10	6%	0	0%	0
Total	169	100%	43	100%	1162

Moreover, the opportunity to state “I do not know, I do not understand this indicator” was also given, since participants may have been not familiar with some technical indicators extraneous to their own field of competence. The option to add indicators to each of the nine categories, or independently from the proposed categories at the end of the questionnaire, was also given if participants considered that some important aspects were missing.

Once all the participants completed the questionnaire, the indicators were put together into an ordered list based on the frequency of essential votes. To accomplish the required elaborations, indicators were assigned a numerical value based on the rating they received (Essential – 3; Desirable – 2; Of tertiary importance – 1; I do not know – 0). A list of 43 indicators collected all those rated as ‘essential’ by more than the 50% of the sample, which meant those attracting more than 20 essential votes (Table 9.3). This list was brought forth to the next steps.

This initial step of the process allowed to:

- Reduce the list of KPIs to a manageable number of items based on the convergence of opinion (expressed anonymously) across multiple workplace users;
- Identifying the user categories who did not understand some of the indicators, and question whether this misalignment was important to fix or should be considered ‘physiological’; and
- Finding out convergence/divergence of opinions across users, and across different companies to argue in the following step.

9.3.3 Acknowledgement of group views and different opinions on essential KPIs

The second stage of the Delphi method aimed to compare, contrast, and discuss openly among the expert group the choices that were made anonymously in the previous activity. It is worth pointing out that, at this point, the participants had all already gone through the previous questionnaire individually, and therefore the

assumption was that they had become accustomed to the topic and had formed some conscious ideas. The discussion was guided to address (i) the definition of each indicator, which should be comprehensible to all the users; (ii) the placement of each indicator in the corresponding category and impact class; and (iii) the actual importance of each indicator compared to the others – whether it should be dropped or kept in the list.

Given that six indicators had been added while answering Questionnaire 1, the list of 43 indicators was integrated with those six before bringing it to group discussion. Therefore, 49 indicators (43 + 6) were finally debated, also considering the similarity of the newly proposed KPIs with already existing ones. In this phase, people could still erase unnecessary indicators, retrieve indicators from the initial 169-item list, or suggest new indicators, which they believed relevant to all workplace users.

The discussion was undertaken through either one-to-one interviews or focus groups. The latter were encouraged by the researcher, but not all the companies had the possibility to organize them. Therefore, single interviews were scheduled when necessary and the researcher put together the results of the individual conversations afterwards, through qualitative analysis. Thanks to this process, the KPI list was compressed from 49 to 33 indicators. Thanks to group discussion, each item was confirmed or re-assigned into a thematic category and a class of impact/value (see [Tables 9.4](#) and [9.5](#)). Many suggestions stood up about the opportunity of having a dashboard where KPIs could be compared to internal benchmarks. For refinement of the final set of indicators, a few people proposed to organize indicators in a tree-like structure. In fact, a passage encompassing KPI ordering was faced in the next step of analysis, through Questionnaire 2.

This second step of the process allowed to:

- a Discuss workplace impacts/value openly, thus fostering opinion sharing among users who rarely can meet and exchange their respective ideas. This greatly enriched the view over impacts to recognize that organizational, environmental, or social impact cannot be evaluated in isolation but are transversal. However, participants all agreed upon the usefulness of classification and categorization, especially for easier recognition of the professionals dealing with the related indicators.
- b Come up with new creative ideas on how to compose and represent the final set of indicators, in order for it to become a dashboard for information sharing among all workplace users. A few people proposed to give evidence to prioritization. Questionnaire 2 was set up exactly to let prioritization and applicability of KPIs emerge.

9.3.4 Synthesis and future strategies

At this point of the Delphi process, the short list of 33 indicators, appropriately reordered and systematized by the researcher as per it was re-elaborated during focus groups and interviews, was submitted once again to the same participants.

Table 9.4 Building operation and management KPIs before discussion

Category	Class – Impact/Value		
	Financial/ organizational	Environmental	Social
Building operation and management		<ul style="list-style-type: none"> • Accessibility for disabled • Ethics, health and safety practices (Health and safety, Provision of safe environment) • Networking IT • Competence of staff • Reliability • Effectiveness of help desk service, Response time, Responsiveness to problems • Telecommunications • Standards of cleaning • Security • Correction of faults • Resource consumption (energy, water, materials), Sustainability objectives (waste, energy consumption, etc.), Environmental sustainability of buildings - <i>Number of requests made vs. number or requests met with timing</i> - <i>Number of audits/month</i> - <i>Response time</i> - <i>Resolution time</i> - <i>Cost of corrective intervention</i> 	

Legend: The dotted list contains KPIs from the literature; the dashed list collects the KPIs added in Questionnaire 1.

Table 9.5 Building operation and management KPIs after discussion

Category	Class – Impact/Value		
	Financial/ organizational	Environmental	Social
Building operation and management	<ul style="list-style-type: none"> • Cost of corrective intervention 	<ul style="list-style-type: none"> • Standards of cleaning • Number of FM requests made vs. number or requests met with timing • Resource consumption (energy, water, materials), Sustainability objectives (waste, energy consumption, etc.), Environmental sustainability of buildings 	<ul style="list-style-type: none"> • Design for All (Accessibility for disabled) • Quality of communication strategies to encourage ethics, health and safety practices • Reliability of the maintenance service (Competence of facility management staff)

Table 9.6 Average grade by KPI categories and users

Overall averages	EQ	BOM	PW	SU	CO	UA	SC	BE	VRY	Total
CREM	5,61	5,14	5,00	5,50	5,50	4,67	4,67	5,00	4,50	5,07
Designer	5,83	5,86	5,92	7,00	5,00	5,00	4,33	6,75	3,00	5,41
FM	3,11	3,86	4,00	7,00	5,00	6,33	7,00	0,00	0,00	4,03
Owner	4,33	4,86	4,50	4,00	6,00	3,00	2,67	2,50	0,00	3,54
Consultant	5,91	6,10	5,97	5,00	5,75	5,42	5,39	4,67	5,00	5,47
Manager	6,64	6,10	5,97	5,67	5,60	5,83	5,77	5,20	5,50	5,81
HRM	6,35	6,48	6,28	6,00	6,00	6,00	6,28	5,33	5,00	5,97
CFO	5,50	6,07	6,25	6,00	4,00	6,17	5,83	5,75	6,00	5,73
Employee	6,54	5,86	5,89	4,67	4,67	5,56	6,11	4,67	5,00	5,44
ICT	6,17	5,49	5,19	6,00	6,33	5,14	5,39	3,50	3,50	5,19
Total	6,09	5,88	5,80	5,79	5,57	5,54	5,52	5,15	4,87	5,58

Legend: EQ = Environmental Quality; UA = User Attitude; BE = Business Effectiveness; SC = Staff Characteristics; PW = Productivity/Ways of Working; BOM = Building Operation and Management; CO = Costs; SU = Space Usage; VRY = Value/Return/Yield.

Submission happened through a second online questionnaire to fill up anonymously, where people were asked to (i) rate the level of importance they attributed to each KPI (on a scale from 1 to 7); and (ii) declare whether each indicator was currently measured in their company or not, based on their personal knowledge.

Matching this information allowed the assessment of indicators' applicability to workplace management. At first, participants were requested to assign a 'priority' grade to each KPI from 1-low importance to 7-high importance. It was possible to avoid awarding a KPI if considered erasable from the final list. Priority grade corresponded to the sum of all grades received by all users who participated in the questionnaire. The grades different users assigned to KPIs were on average quite flattened across user categories, except a few cases, and partially resembled the results obtained with Questionnaire 1. This showed that the choices made by all user categories were quite stable at this point and confirmed the convergence of opinion among them (Table 9.6). Moreover, the priority grade indicated the importance workplace users attributed to each indicator, which reflected people willingness to contribute to KPI measurement, their level of engagement in information sharing, and the value they credited to that specific aspect of the workplace (by category and class).

Second, people were asked about 'measurement practices' in their respective organizations, namely if each KPI was already gathered in their company (possible answers "Yes/No/I don't know"), as a proxy to indicate 'readiness for adoption'. The probability of data availability was obtained through the mean average of Yes answers, compared to the theoretically possible 100% of Yes answers. The assumption was that, if data were already available in most of the companies, this corresponded to relative preparedness of technologies, methods, and competences to bring the KPI from theory to operation.

By representing these two elements on a dispersion graph, it was possible to obtain an 'opportunity scale' for KPI management (Figure 9.1). Sequential numbering

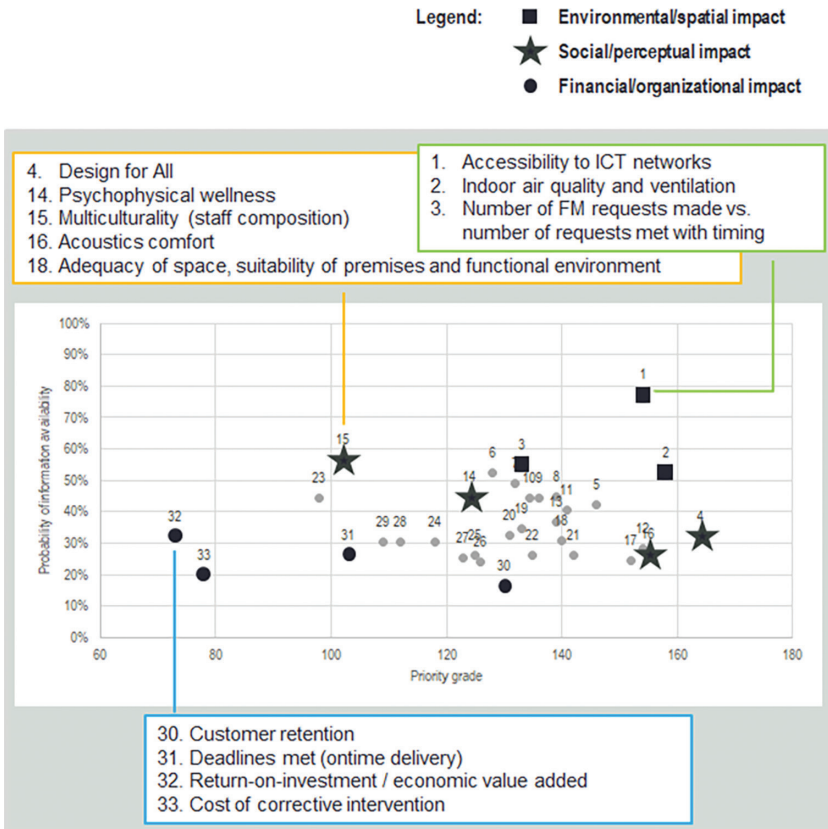


Figure 9.1 Opportunity for KPI measurement and management

of KPIs in the dispersion graph is based on the sum of the percentage level of priority grade on the maximum priority obtainable and the percentage number of *Yes* answers on the total number of participants. Indicators that fall in the top right area are those scoring a high priority grade and a high probability that data are already available to populate that KPI.

This third and last step of the process allowed us to:

- Produce an operational tool in a matrix-like structure that can help all workplace users interpret indicators and their interrelations and, in turn, support the elaboration of strategies throughout the design, management, and use phases of the workplace;
- Attribute the ‘ownership’ for KPI monitoring, namely identify the roles entitled to control indicators in the financial/organizational class (typically CFO, Owner, CREM, and FM); in the environmental class (i.e. FM, CREM, and ICT); and in the social class (i.e. HR, FM, CREM);

- c Recognize the most ‘active’ user categories and those who, instead, are not yet involved enough in the workplace-making processes (in the case under analysis, for instance, HR and ICT seemed rather detached from the topic) and start elaborating on the opportunity to attract them to workplace matters better; and finally
- d Realize that when companies go through a workplace change, they tend to become keener on collaborating into cross-departmental and cross-role activities towards the achievement of common interest, which Delphi can greatly support.

9.4 Implications

In the case presented above, Delphi proved effective in bringing together several workplace users, who usually remain isolated in the organizational debate around workplace matters, and make them focus on a common goal (e.g. the systematization of KPIs to support workplace management strategies). The method has both research and practical implications. On the one hand, it may help researchers answer questions of scientific relevance and advance academic knowledge. On the other hand, due to its very nature, it implies deep interactions among the participants, including the same researcher, and thus becomes an operative tool.

9.4.1 *Method relevance to research*

One of the aspects of Delphi that generates mixed feelings lies in its intrinsic combination of quantitative and qualitative approaches, by merging a positivist and a constructivist attitude to research (Mullen, 2003). To some extent, Delphi produces quantified results within a recognizably positivist tradition, whereas, to some other extent, the definition of the problem and the solutions to it, produced by those who are the same subjects of the research, place it close to a constructivist position. Delphi straddles the divide between qualitative and quantitative methodologies (Cricher & Gladstone, 1998). Despite this appreciation, still many recent criticisms of Delphi and attempts to prescribe the ‘correct’ process stem from the positivist critique. This ambivalence can, indeed, be tricky during research, and somehow difficult to handle. Nevertheless, it also demonstrates the uniqueness of the approach and places it in a very interesting position in-between disciplines. This might be the secret of its success across multiple disciplinary areas, from the hard to the soft sciences, since its inception some 70 years ago. Thus, it is important that Delphi is not confined to limited application areas but exploits the potential of cross-fertilization across disciplines (Mullen, 2003).

Among other classic targets of criticism, sources of controversy and misunderstandings about Delphi’s relevance to research are: the use of an ‘expert’ panel, the claim of consensus, questionnaire construction, and the alternation of anonymity and interaction between panel members (Mullen, 2003). These are all partial limitations embedded in the method that can be as well considered strengths and opportunities for deeper and multi-faceted interpretation of the phenomenon under analysis. For instance, the alternation of individual reflection and group discussion is a great way

to let people think on their own when their single characteristics (either professional or psychological) can emerge, and balance those reflections with group discussion when other opinions may come up and smoothen or radically change some of the initial ideas. This openness is rather unique to the Delphi approach and might be of particular benefit in the workplace realm where research struggles to keep together so many different stakeholders needs and managerial strategies. Nonetheless, caution is recommended especially in corporate environments where open expression of opinions may lead to repercussions on the individuals or unpleasant re-adjustment of power relations. The flexibility of the method though makes it possible to opt for overt or more covered idea sharing. In addition, the review of opinions is encouraged during the process, so that the same researcher responsible for data elaboration in due course goes through some sort of peer-to-peer confrontation that usually happens only in a later stage of the research process. Such an exchange puts Delphi in a privileged position in-between research and practice.

Finally, many suggest that Delphi should be used in combination with other methods as a part of a wider process (Rowe & Wright, 2011). In order to encourage broader adoption of the method, studies could do a better job of describing the application of the process itself, by giving details on the scoring, aggregation, and feedback of methods employed (Mullen & Spurgeon, 2000), as I did in this chapter and few other reports do.

9.4.2 Method relevance to practice

We are in a new era when presence in the office is unpredictable and engagement is difficult to assure due to opportunities for conventional meetings thinning out. Delphi might foster a constructive debate about the workplace and create common ground among people who share similar stakes in the office environment but do not live it and use it in the same moments nor in similar ways. Delphi comes handy to compare and contrast views of the workplace that are unlikely to emerge otherwise. Moreover, compared to conventional surveys, Delphi allows some degree of interaction and exchange, via feedback and justification, between respondents and between respondents and researchers. Therefore, it has the advantage of reflecting a process of decision-making that, by its nature, happens in a progressive way by reconsidering judgments and revising conclusions. This is of utmost importance for companies and decision-makers in a time when working conditions are more changeable and uncertain than ever before. Finally, Delphi may help identify a set of agenda items to intervene in the workplace by priority and support its progressive reassessment while the future is getting closer. In the example shown above, the method supported multiple achievements, including letting different stakes emerge and express themselves in a protected and constructive environment; democratizing workplace management and putting all users on the same level (executives, employees, building operators, etc.); and helping take a direction for future management strategies in the workplace based on shared priorities. Especially when figuring out new workplace performance indicators, Delphi stimulates innovative ideas about KPI measurement and management, responding

to the inadequacy of traditional real estate metrics for complex environments; making stakeholders more familiar with metrics and results; helping executives make sense of a large variety of data points to gauge performance (JLL, 2017); and going beyond mere quantitative data to identify value-adding elements for organizations.

Therefore, the method can be used to change the company culture and rebalance power relations, even though it must be considered that the method is very old and back when it was initiated the world of work was very different (e.g. hierarchy in decision-making, the need for anonymity, and more). Even more so, it depends on the working culture of each organization how the method can be implemented.

One thing to be noted is that the method was originally for the purpose of envisioning something that did not yet exist, but in workplace management, so far, it has been used more for shorter time perspective than in other real estate areas. This might be due to the fact that the time span of land use planners, institutional investors, etc., is longer than that of corporate real estate players and workspace users.

Overall, this method resembles the management techniques for stimulating creativity and innovation, which are based on the alternation of divergent (openness) and convergent (focus) phases in order to bring in new ideas and verify if they make sense. Companies may already be familiar with them and, therefore, trust the process and be more likely to participate. Making the implementation of Delphi a more common practice will be useful for the full deployment of workplaces' potential.

9.5 Conclusions

This contribution adds to other studies providing guidance for applying Delphi in the workplace realm. The chapter has introduced the approach proposed by Delphi and demonstrated its potential in workplace research and management for understanding relations between elements, forecasting and futures studies, priority setting, and user involvement. The method does not come without risks and limitations. Attention should be given to creating the necessary heterogeneity of panel participants, improving question formulation, enhancing panellist retention throughout subsequent rounds, enhancing information exchange between participants during feedback stages, and combining Delphi with other techniques (Rowe & Wright, 2011).

For instance, in the experience presented above one of the companies showed resistance at some point and many participants dropped out of interviews and, later, Questionnaire 2. A lack of bonding with the research aim should be expected. A Delphi technique is not costly in monetary terms but requires a prolonged series of interactions between participants and researchers, which is difficult to evaluate at the very beginning of the process in terms of effort for the companies over time. Despite good intentions, many factors can intervene in the meantime to obstruct companies from participation during the whole Delphi development. Nevertheless, the dropout rate may have been also due to the chosen process entailing in-person exchange. The risk is that the loudest voice rather than the soundest argument may carry the day; or a person may be reluctant to abandon a previously stated opinion

in front of his peers; and when one disagrees with the boss, the discomfort might be discouraging. Anyways, Delphi gives a good possibility to change views without losing face in front of colleagues. Therefore, the study setting must be carefully evaluated to prevent uneasy situations.

There is also significant limitation about generalizability, especially when the sample size remains small – this is counterbalanced nowadays by online Delphi that can be spread widely across the population. Considering the example in this chapter, someone could contend that every building and every organization are different, so that every assessment should be done on a case-by-case basis. Indeed, the experts in this case remained isolated by company and it was the researcher's responsibility to combine their viewpoints. Delphi is often used for experts that come from different fields and organizations. In further developments of this study, some outsiders could be invited, or cross-company meetings could be organized to foster the generalizability of the results. Some assert that relevant working performance measures should be defined by each individual company or business function (Hinks & McNay, 1999; Kämpf-Dern & Konkol, 2017) as many criteria vary greatly, e.g. (a) type of users (typically facility manager, executive level management, etc.); (b) nature of the organization (private or public); (c) focus of the assessment (e.g. financial, functional, physical); and (d) industry trends (Lavy et al., 2014). However, when buildings are constructed for particular purposes and at a certain time in history, they tend to have many similarities, or at least they apply similar design strategies (Becker, 1990); hence, it is likely that they share a similar view towards the future.

Organizations do change over time, which is why it is important for assessment tools to treat departments, divisions, or other organizational units with sufficient detail. Indeed, the very aim of Delphi, when it is adopted for sincere research purposes and not for political reasons, should be not to force artificial consensus among the parties but to let different opinions emerge, challenge them against one another, and find stability.

Finally, two questions remain still open regarding the application of a Delphi method, especially when it applies to scenario creation (Marchais-Roubelat & Roubelat, 2011) – which is not the case of the study presented in this chapter but is worth discussing for prospective applications. First, does the knowledge of future scenarios affect the production of a self-fulfilling prophecy? Throughout the process and afterwards, the behaviour of the involved experts might be oriented so that the events themselves tend to unfold as per they were virtually forecasted. Second, research in neuroscience suggests that different areas of the brain react to different levels of uncertainty. Does this mechanism have the same effect on all experts or could this somehow influence in different ways the experts' engagement in the process? We should still consider that the purpose of future studies is not to predict a certain future but to picture alternative futures and steer the stakeholders into a different direction than the one that would naturally occur given certain conditions. As for now, it looks like Delphi in workplace contexts has been used typically for other purposes than foreseeing possible futures or other future-related issues. It would be interesting to see more experimentation on this kind of application.

This chapter should conclude with some recommendations for the employment of the method. Nevertheless, Linstone and Turoff (1975, p. 6) invite to beware of the potential problems arising “when a Delphi designed for a particular application is taken as representative of all Delphis”. In sum, the method must be applied with a critical approach to enable researchers and practitioners find answers and even new questions that they did not know how to express beforehand (Rowe & Wright, 2011).

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9.7 Further Reading

About futures studies, their foundations, and epistemological considerations, it is recommended to look at the seminal books by the sociologist Wendell Bell:

Bell, W. (1996). *Foundations of futures studies: Human science for a new era, vol. 1, 'History, purposes and knowledge' and vol. 2, 'Values, objectivity and the good society'*. Transaction Publishers.

By the same author, there is a commentary on the meaning and importance of future studies for the society:

Bell, W. (1998). Making people responsible: The possible, the probable, and the preferable. *American Behavioral Scientist*, 42(3), 323–339. <https://doi.org/10.1177/0002764298042003004>

For those who want to have a broad and fast overview of the study of the futures, Puglisi (2001) conference paper compares and contrasts multiple different futures studies methodologies. It describes in sufficient depth some interesting classification of futures techniques and discusses in particular: forecasting methods, environmental scanning, simulation and modelling, black-view mirror analysis, Delphi, scenarios, visioning, futures biographies, futures workshops, causal layered analysis:

Puglisi, M. (2001). The study of the futures: an overview of futures studies methodologies. In D. Camarda & L. Grassini (Eds.), *Interdependency between agriculture and urbanization: Conflicts on sustainable use of soil and water* (pp. 439–463).

Digging into futures methods applied in workplace research, Saurin's (2012) doctoral thesis provides an intriguing combination of methods within the Prospective Through Scenarios process to assist organizations and facility managers in workplace planning for effective long-term strategies:

Saurin, R. (2012). *Workplace futures: A case study of an adaptive scenarios approach to establish strategies for tomorrow's workplace* [Doctoral thesis]. Technological University Dublin. <https://doi.org/10.21427/D7PG6H>

Finally, Marchais-Roubelat and Roubelat (2011) extensively discuss whether 'Delphi' is just a namesake for the Delphic Oracle or if it makes sense to seek a parallel between the two approaches, especially in order to better understand the characteristics of the knowledge revealed, on the one hand, and the role of the actors in the inquiring process, on the other:

Marchais-Roubelat, A., & Roubelat, F. (2011). The Delphi method as a ritual: Inquiring the Delphic Oracle. *Technological Forecasting and Social Change*, 78(9), 1491–1499. <https://doi.org/10.1016/j.techfore.2011.04.012>

Notes

- 1 The Office Buildings and Information Technology (ORBIT) studies were carried out in two separate stages, in the 1983 and the 1985. Led by DEGW, the aim of the studies was to identify the impact of new technologies on office design.
- 2 The findings of this study sponsored by HOK, JLL, Planon, and Savills were presented during World Workplace in Nashville on 28–30 September 2022. https://events.ifma.org/worldworkplace/2022/conference_schedule.cfm

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