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Collectively innovating; modelling responsible exposure in heterarchical organisations

Modelling
responsible
exposure

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Abstract

Purpose – This paper aims to develop a model of collective innovation, with respect to innovation strategy, structure and culture in heterarchies. The enabling of collective innovation in heterarchies is conceptualised as “responsible exposure”.

Design/methodology/approach – A study adopting cross-case analysis was undertaken with five organisations perceived to have heterarchical characteristics. These included one small company, two medium-sized companies and two larger companies, all were European. Data from semi-structured interviews, a survey of staff and other sources provide evidence of collective innovation practices.

Findings – The cross-case analysis suggests that the management of collective innovation is different from “classic” innovation management. It is more about enabling “responsible exposure” than the management of “shelter” for collective innovation.

Research limitations/implications – The strength of cross-case analysis and conceptual framework validation is limited by the cases being all from the European region.

Practical implications – What strategy, structure and culture for “responsible exposure” may mean can be described. Heterarchies will always be relatively rare, though lessons from how they enable collective innovation can be more widely learned. Lessons for the wider population of organisation that combine hierarchical and heterarchical characteristics and seek greater innovation are identified.

Social implications – Collective innovation, which requires “responsible exposure” has implications for the capabilities of managers and professionals concerned with innovation.

Originality/value – The cross-case analysis of innovation in heterarchies is original, leading to the description of a model of “responsible exposure” for collective innovation.

Keywords Innovation, Innovation management, Heterarchy, Non-bureaucratic

Paper type Research paper

Introduction

Research on innovation management is concerned with identifying the optimal organisation strategies, structures and culture for innovation, a theme recently explored in depth in charting the future of innovation management in this study (Trusko, 2017). The need to engage broad and various agents inside and around the organisation in innovation, through collective innovation, will be significant in the future. “Classic” innovation management (Harrington and Voehl, 2013) prescribes a recognised and established “recipe” for innovating. That recipe is aligned with contexts where the typical organisation is understood to be, or presumed to be, a hierarchy. There is an alternative context, where an as above is actually, or aims to be, more of an adhocracy. That is the organisation is not wholly or mainly a hierarchy and has more heterarchical characteristics (Leavitt, 2003;



Damanpour and Aravind, 2012). Innovation strategies, structures and culture in heterarchies are not so well understood (Gupta, 2011).

With more organisations having or aspiring to gain the advantages of heterarchical forms, the systematic exploration of collective innovation in organisations with the characteristics of heterarchy is increasingly relevant for knowledge about effective innovation management.

Classic innovation management as prescribed in textbooks can be characterised as creating “shelter”, a safe space for collective innovation in a hierarchical organisation (Tushman and O’Reilly, 1996). Table I shows the elements of strategy and direction, processes and structure, as well as culture and leadership, commonly associated with classic innovation management providing the metaphorical and actual “shelter”. Such shelter for collective innovation requires the formalisation and centralisation of processes and structures associated with classic innovation management, a bureaucracy for innovation management (Blau and Page, 1968; Hoepfl, 2006). Formalisation refers to the degree to which work procedures and individual tasks and responsibilities are prescribed by formal rule; centralisation describes the degree to which decisions are made by few individuals at a high level of the hierarchy (Damanpour, 1996). Formalisation and centralisation, the central characteristics of bureaucratic hierarchy, are consistently found to impede rather than support innovation (Damanpour, 1996).

In organisations that are more heterarchical innovation would be expected to “look” and “feel” different. How the look and feel of innovation will differ may be manifest and visible in forms ranging from workplace and workspace design to the level of engagement of staff in innovation processes. This will reflect how heterarchical practices shape leadership styles and the emotional climate, such as no-blame cultures and an openness to learning from mistakes. In brief, while hierarchies are typically and strongly embodying the value of control through fixed lines of managerial authority in innovation management in contrast heterarchies will be embodying the openness and inclusion of “all” in enabling innovation.

There is an extensive nomological network and multiple constructs to describe non-hierarchical organisation forms (Bhargava and Sinha, 1992). The construct of “adhocracy” in the management literature is probably the most commonly used of these various terms to characterise these types of organisation (Mintzberg, 1979; Cameron *et al.*, 2006; Scott *et al.*, 2003) and widely used and to explore their strategies, processes and culture (Degraff and Quinn, 2007; Hartnell *et al.*, 2011; Talbot, 2008). Adhocracies are less hierarchical and more heterarchical. In a hierarchy resources and relations are structured in one fixed way,

Elements of classic innovation management

Strategy and direction	Common vision guides developments Clear innovation strategy and search fields guide ideation and development Strategy development as top management task Ex ante strategy development/planning ahead
Processes and structures	Management as innovation driver: communicates importance and values performance Management as power promoter: uses power to provide resources and guard innovations Empowerment and high levels of individual responsibility by employees Innovation supportive values: open communication, collaboration, knowledge sharing
Culture and leadership	Management as innovation driver: communicates importance and values performance Management as power promoter: uses power to provide resources and guard innovations Empowerment and high levels of individual responsibility by employees Innovation supportive values: open communication, collaboration, knowledge sharing

Table I.
Elements of classic innovation management (Stern and Jaberg, 2010; Cooper, 2013; Vahs and Brem, 2013)

permanently, to favour control from the “top”; in a heterarchy resources and relations possess the potential to be structured in a number of different ways, time and time again, with multiple potential agents of control (Crumley, 2015).

“Heterarchy” can be adopted as the conceptual framework for these (Spelthann and Haunschild, 2011; Schoenherr and Dopko, 2019). Heterarchy in organisation is defined as relations among elements that are not fixed and ranked, or relations among elements that can be ranked in a variety of ways, flexibly (Crumley, 2008; Cumming, 2016). Heterarchy can be seen as manifest by empowered and self-directing individuals and teams (Sarooghi *et al.*, 2015; Litchfield *et al.*, 2017), horizontal coordination among networks, with flexibility as characteristic of the organisation as a whole (Reihlen, 2009) and a whole organisation culture embodying innovation friendly values (Colombo *et al.*, 2017; Jaakkola and Hallin, 2018). Many organisations seek to possess some heterarchy characteristics, some of the time, in some of their constituent parts (Hamel, 2007; Hamel, 2011). It is only fully heterarchical organisations that have these characteristics as a whole in all their parts (Stark, 2009).

The belief that innovation is being differently and better enabled in heterarchical organisations is both logical and widely presumed (Anderson and Brown, 2010), though it has rarely been systematically researched to examine if and how heterarchy does favour and enable innovating. One challenge is that an authentically and wholly, purely, heterarchical organisation is conceivable in theory but unlikely to be found in practice. Examples that may appear to be wholly heterarchical, in the management literature and gain attention (Bernstein *et al.*, 2016; Wang, 2010) are either recognised as rare and “maverick” (Semler, 2001) or turn out to not be wholly heterarchical. This may be because explicitly espousing a formal heterarchy is in itself not necessarily the whole picture, if informal organisation structures and networks are recognised as a feature of most organisation (Morton *et al.*, 2004). Such informal organisation may shape behaviour and communication well after any transformation to non-hierarchical structures (Diefenbach and Sillince, 2011).

A conceptual framework

The construct of heterarchy was first used in a neurological context, to describe the brain as having relations rich in interconnectivity and complexity (McCulloch, 1965) where the elements may take on different relations according to needs rather than always fixed in a rank order. In the contemporary context heterarchy can be applied to domains as diverse as organisational form and political movements (Santini and Moro, 2019; Schoenherr and Dopko, 2019). The possibility of a co-existence of heterarchy and hierarchy in organisational forms, rather than a binary differentiation between these as sole an exclusive forms of organisation, is generally accepted (Diefenbach and Sillince, 2011). In other words, heterarchy alone and by itself as a principle of organisation is unlikely to be found in workplaces and employment contexts; rather self-organisation will co-exist with hierarchy (Crumley, 2008). Organisations that are, overall, more hierarchical than heterarchical are believed to manage collective innovation in what can be described as the “classic” ways described in textbooks. Organisations that are, overall, more heterarchical than hierarchical (see Figure 1) are believed to enable collective innovation in ways not described in textbooks, though their actual practices are not currently as well developed in conception or evidence.

In classic innovation management the creation of “shelter” has advantages and disadvantages for innovation (Brown and Eisenhardt, 1995; Pfeiffer *et al.*, 2012; Wolf, 2011). Shelter protects that which needs nurturing, especially the first and early manifestations of the new and different which will be vulnerable. However, shelter can also be constraining; limiting, even potentially distorting, albeit in the name of nurturing. The problem and

unintended adverse effects of “sheltering” for innovation have been widely recognised (Tidd and Bessant, 2013; Hauschildt and Salomo, 2011). Specialised departments for R&D or innovation management can create “silos”, restricting cross-department communication and collaboration. Key decision makers may not have optimal information, or make plausible decisions, creating a climate of mistrust leading to potential demotivation. Creating “Innovation Manager” as an organisational role, with a job description and specified tasks, competences and responsibilities can lead to others not feeling responsible for innovation and viewing innovation as being “on top” of their own duties and responsibilities. Formalised innovation processes, with clearly defined phases, activities, selection criteria, controlling mechanisms can seem to focus on justification rather than helping to realise ideas and so dampen passion. Finally, the formality of communication between idea-givers and decision committees can involve a lengthy process, with a high risk of misunderstandings and rejections of proposed ideas without appreciation.

These are problems and concerns to which some have looked to alternative organisational forms of a heterarchical kind as a solution. In more heterarchical organisation all activity, not just innovation, is collective. They practice governance by those most relevant, depending on the task at hand and according to their problem-solving skill and situational expertise (Reihlen, 2009). There are multiple kinds of agency and capacity present among all those in the organisation, forming specific kinds of authority relationships of short-duration, then concluding these with scope for reforming in different authority relations. Organisations with process-structure embodying such heterarchical relations are by their very nature going to have horizontal peer-to-peer relations, authority exercised in a context-specific rather than universalist way and with multiple have sources of decision control (Davies, 2009). To be more heterarchical the following characteristics are often cited (Hedlund, 2005):

- a network structure rather than a division of labour based upon functional specialisation and clearly separated departments;
- authority and influence is exercised other than through a fixed hierarchy with top-down authorities in control;
- culture and values are the primary mechanism for coordinating individual and collective action rather than a set of rules; and
- informality and high degrees of interpersonal communications in many channels rather than top-down, formal communication.

All members of an organisation are, in effect, responsibly exposed to engagement with innovation rather than innovation being about managing the sheltered few. Existing

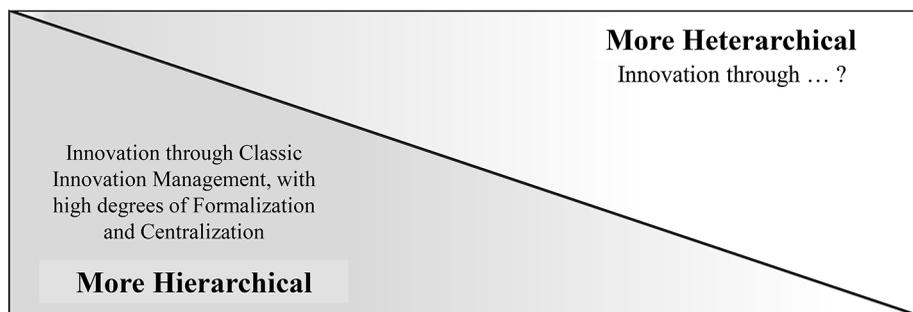


Figure 1.
Innovation
management context

empirical research on these kinds of organisation is limited. Some research provides general descriptions of the functioning of individual hierarchies, rather than specifically their innovation mechanisms (Semler, 2001; Hamel, 2011; Kumar and Mukherjee, 2018). Some considers the innovativeness of more heterarchical organisations as compared to more hierarchical organisations (Bhargava and Sinha, 1992; Damanpour, 1996; Liu *et al.*, 2008; Keum and See, 2014; Savage *et al.*, 2019). There are very few cross-case studies of innovation in hierarchies, most considering only an individual case (Steiber and Alänge, 2013; Taylor *et al.*, 2019). Evidence about the strategies, structures and cultures of more heterarchical organisation as they, specifically, collectively innovate is lacking. The strategy-direction, process-structures and culture-leadership of collective innovation in hierarchies can be explored to identify the practices present (Stern and Jaberg, 2010; Cooper, 2013; Goffin *et al.*, 2009; Bednall *et al.*, 2018).

The research gap is about understanding the practices of heterarchical organisations. Three research questions, which help focus on and address this are:

- RQ1.* How is collective innovation managed in organisations that are authentically heterarchical?
- RQ2.* What process-structure, strategy-direction and culture-leadership practices are associated with collective innovation in these authentically heterarchical organisations?
- RQ3.* What kind of model might help describe the collective innovation of authentically heterarchical organisations?

Methods

To explore the research gap and research questions it was necessary to identify candidate hierarchies to include in cross-case analysis. The initial criteria for case study organisation candidates was that an organisation be known for their non-hierarchical form of organisation and with a reputation for innovativeness. For practical reasons, as fieldwork visits were planned, the identification of organisations was confined regionally, to Europe. By checking the popular management literature, other media and social media coverage of their heterarchical form of organisation, business awards for organisation and recommendations from personal networks, organisations with a reputation for being heterarchical were identified. Five organisations of varying size and sector were identified using these sources and agreed to be part of the study. These were organisations in health care, consulting, software, fire engineering, heavy industries (Table II). The table provides a brief account of the background, history and study interview details for each organisation arranged by organisation size.

The organisations were based in Germany, Switzerland and The Netherlands. A degree of cross-case analysis and therefore analytical generalisation is possible from such a sample, to develop and validate a conceptual framework. There are clearly limits to generalisation even in the context of Europe, given the size of the sample and scope for further validation or modification of the conceptual framework through larger samples enabling greater cross-case analysis, including organisations in the European region and elsewhere.

Semi-structured interviews with organisation founders and employees were completed to explore these heterarchical case organisations' innovation. A survey of employees' experiences of collective organisation was distributed. Company documents, organisational charts and values statements were accessed. Visits to some workplaces were possible and completed, with meetings and observation of features such as workspace architecture.

Size	Case	Details	
Small	A	Background	Consulting with focus on digital transformation processes Leipzig, Germany, founded in 2012, 10 employees (2016)
		History	Non-hierarchical from beginning
		Interview details	Two interviews; November/December 2016; interviewees: CEO and founder, senior consultant
Medium	B	Background	Fire engineering and consulting Berlin, Germany, founded in 2000, 180 employees (2016)
		History	Changed to non-hierarchical in 2009
		Interview details	Three interviews; December 2015; interviewees: CEO, talent management, Scrum master
	C	Background	Human Resources software and consulting Sankt Gallen, Switzerland, founded in 2009, 150 employees (2016)
		Org. history	Non-hierarchical from beginning
		Interview details	Five interviews; February/March 2016; interviewees: CEO, chairman, employees from talent management, product management and methods expert
Large	D	Background	Home care for the elderly, maternity and mental care, based in Almelo, the Netherlands, founded in 2007, 10,000 employees (2016)
		History	Heterarchical from the beginning
		Interview details	Two interviews; December 2015 and March 2016; interviewees: CEO and founder, nurse
	E	Background	Global corporate operating in various industries, based in the USA, founded in 1892, 300,000 employees (2016)
		History	Restructured several times
		Interview details	Three interviews, November 2016, interviewees: senior principal and innovation manager, senior principle for strategy development and researcher

Table II.
Case organisations participating in the study

These various sources of data are given in [Table III](#). These can be analysed to show by case if each of the sources, including interviews, documents, workplace visit and work space analysis, employee survey and external views (media/awards) either support wholly, partially or not for innovations' and being authentically heterarchical. Case A is wholly supported for innovativeness and heterarchy. Case C is next most strongly supported,

		Interviews	Documents	Workplace visit and work space analysis	Survey	External view (media)	
Table III. Triangulating five data sources regarding innovativeness/heterarchicalness	Case A	Innovativeness	Supports	Supports	Supports	Supports	
		Heterarchicalness	Supports	Supports	Supports	Supports	
	Case B	Innovativeness	Supports	Supports	–	–	Supports
		Heterarchicalness	Supports	Supports	Supports	–	Supports
	Case C	Innovativeness	Supports	Supports	Supports	Supports	–
		Heterarchicalness	Supports	–	Supports	Supports	–
	Case D	Innovativeness	Supports	Supports	–	–	Supports
		Heterarchicalness	Supports	–	Supports	–	Supports
	Case E	Innovativeness	Supports	–	Supports	–	Supports
		Heterarchicalness	Supports	–	Supports	–	Supports

though there is a lack of external support on either innovativeness or heterarchy. Cased D is also strongly supported, though the workplace and workspaces are not consistent with this. Case B is strongly supported for being heterarchical but not wholly for innovativeness. Case B is the case where there is partial support for innovativeness and heterarchy across most sources.

Typically interviews alone are the data source used in cross-case analysis of this kind. In this table there is triangulation and presentation of a large amount of complex data from multiple sources, not just interviews. The status of the triangulation of these data sources on collective innovation is indicated in the respective sections of the table as fully or partially supporting heterarchy and innovativeness. If the data source does not indicate high heterarchy or strong innovativeness, this is indicated by the cell being blank. If the data source does indicate high heterarchy or strong innovativeness it is greyed.

Semi-structured interviews meant that a few set questions about processes-structures, strategy-direction and culture-leadership were asked of all (Table IV). For instance, asking “How are ideas for new products and services initiated and realised, from idea to market launch”? might elicit an answer referring to stage-gate based innovation process, which would be coded as a hierarchical response to the question. Responses were followed up with probes on process-structure, strategy-direction and culture-leadership. Interviews were conducted with the organisation founders and employees, in all a total of 15 interviews. A survey with 25 items associated with heterarchicalness was distributed. A total of 37 respondents from all organisations completed the survey.

Interviews were transcribed and analysed using content analysis software MAXQDA with a template analysis approach (Flick, 2014). The categories of processes-structure, strategy-direction and culture-leadership were established prior to the study and all material was coded with respect to these in representing collective innovation. All interview responses were subsumed step-wise, first for each individual interviewee then for all interviews in the case organisation. The other data sources at each of the organisations, survey responses and the rest were also coded with respect to experiences of collective

Exemplary questions from the interview guideline

Introduction	What does innovation or being innovative mean at Global Industries? Can you think of examples where Global Industries developed and launched a substantially new product/offer?
Strategy and direction	What guides or gives orientation when developing new or improved products or services? Is there a strategy, a common vision, goals and search fields for new ideas? What is typically the starting point/impulse for developing new or improved offers?
Processes and structures	How are ideas for new products and services initiated and realised, from idea to market launch? Is there a procedure for transforming ideas into successful new offers? How is decided which ideas to pursue further/realise and which not? Who is involved in selecting ideas for implementation?
Culture and leadership	Whose task and responsibility is innovation at Global Industries? How would you describe the culture or climate of this organisation? What kind of behaviour is expected, what is important in working here? How would you describe a person who particularly performs or fits in well in this environment? How does somebody become a leader in this organisation? How would you describe his/her role when developing something new?

Table IV.
Questions guiding
the semi-structures
interviews

innovation in a similar stepwise way. With this an aggregation of data in each organisation meant each case could be categorised as an instance of heterarchy and/or innovative, or not.

Findings

The results for each case and the cross-case findings are given in a summary form (Table V). This table shows for each of the three areas of strategy and direction, processes and structure and culture and leadership, a number of aggregated findings in each of these with the cases (either case A.B.C.D or E) supporting that cited. For most of the aspects of strategy and direction or process and structure a few cases can be cited. For most of the aspects of culture and leadership all cases can be cited.

These were all heterarchical in their overall organisation practices, albeit to different degrees and all were innovative. This means that the sample is appropriate for an exploration of collective innovation within heterarchies. Process-structure in these is definitely distinctive and does contrast with classic innovation management, although this is not homogeneous among the sample. In strategy-direction more heterarchical organisations also appear distinctive and contrast with classic innovation management. Culture-leadership in more heterarchical organisation as a whole is, however, similar to that prescribed by classic innovation management for innovation departments/units. That includes the presence of what can be described as more “little” leadership amongst many organisation members around innovation, rather than a concentration on innovation controlled by a few “big” leaders in formal roles and with fixed process-structure that shelter innovation. The cases show a clear contrast with innovation in more hierarchical organisations, and consequently scope for innovation management in these to be described.

Dimension	Aggregated findings and cases referenced
Strategy and direction	Common self-conception/organisation purpose guides new developments (found in cases A, B and D) Some elements of strategy are applied but more often no explicit (innovation) strategy or systematic search fields (cases B, C and D) Employees have and use influence on strategic direction (A, B, D and E) Combination of ex ante and emergent strategy (A, D and E) or primarily <i>ad hoc</i> initiatives (B and C), strongly driven by customer needs and experimentation
Processes and structures	No official innovation process but multiple channels (A, B, C, D and E) Idea selection mostly based on few rough criteria, gut feeling, rapid experimentation (all cases) and through discussions (B and D) Employees have far-reaching freedoms to move initiatives and decide themselves (all cases). Everybody leads and follows (A, B and D). Management with prominent influence in selecting ideas (C, D and E) Innovation as everybody's responsibility (A, B, C, D and E), no innovation managers (B, C and D) or few innovation facilitators (A and E)
Culture and leadership	Management strongly encourages innovation (A, B, C, D and E) Management uses power to support innovation: providing budgets and using network (A, B, C, D and E) High levels of empowerment/freedoms granted (all cases) filled by individual and team responsibility (A, B, D and E) Innovation-supportive values: Innovation and experimentation, teamwork, communication and feedback culture, open-mindedness, flexibility, customer-focus, self-directedness and trust (A, B, C, D and E)

Table V.
Aggregate results across cases in the major dimensions of innovation management

The five cases

The two most distinctive hierarchies are people software and home care network. People Software has explicit values and norms, which are reinforced in training, formal elections of leaders, permissive rules on who is involved in which kind of decisions and a multiplicity of possible channels for innovation defined. People Software has a culture where ideas are selected based on “gut feeling,” can be pursued in the “shadow” and tested through rapid experimentation. The options in use range from team-based and non-bureaucratic practices, to those, which include temporary hierarchies and some formalisation.

The large service provider, home care network, has operations and innovation activities with a very limited amount of centralisation and formalisation. It is an organisation lauded as one of the most innovative in its field. Ostensibly there are “no bosses” except for the CEO, who does not see himself, and is not regarded as, someone to provide direction on innovation to others. The path from idea to launch is not formally described and no formal selection criteria are applied.

FIRECO is a medium-sized engineering and consulting firm, has no formal innovation strategy or search fields. Strategic direction given by the CEO, described as visionary, creative and influential. There is no innovation process or idea management system; everybody is responsible for innovation. Having gone through the transformation to heterarchical organisation, high level of freedom are offered and initiative is expected; yet people are hesitant to take more responsibility.

In the small consultancy digital transformers the common purpose and behaviour orientations guide developments. Heterarchical from the start, idea selection happens through discussion and is mostly based on gut feeling and early customer feedback. The founder and CEO take special responsibility in innovation and the person responsible for a certain topic finally takes the decision. However, everybody can contribute.

Global Industries, a research centre of a large corporate, has drastically removed hierarchies. There is no fixed process for innovation. Instead, multiple channels and methods are selected situational. Management still plays a key role, with principles deciding on resources for projects, connecting people, removing barriers for teams and acting as mentors.

In all these cases, a set of corporate values and norms were in place, which were considered to be supportive of innovation, most importantly innovation and experimentation, open-minded, flexibility, accepting failures, collaboration, communication and feedback culture, transparency, knowledge sharing and customer-centricity. While the evaluation of the actual role of such organisation values can be complex (Gibb and Burns, 2018), they are often shown to be meaningful. Working to keep and develop further the values is seen as a very important task. This involves defining the core values and behaviour orientations, being a role model in such values and behaviour; training people; encouraging certain behaviours and giving each other feedback. A further essential part of fostering this culture is hiring the right people, who are seen as central success factor and the selection of which is a major future challenge.

Strategy-direction for innovation management in more heterarchical organisation

The classic view of collective innovation is that innovation strategy and search fields are deduced from the overall company strategy to help focus and guide idea and new product development (Vahs and Brem, 2013). With respect to this these hierarchies provide a mixed picture. Three of the cases do have one or more elements of such strategy, including search fields, roadmaps and product portfolios. Two do not apply systematic approaches for either scanning the environment or planning strategic activity. What is shared is that in these

heterarchies there is a common understanding of the organisations' purpose, which provides a positive context for innovation. Direction is provided through common values and norms. With the content of purpose or vision, in three of the five cases, there is a strong fit between the organisations' culture and the norms and values of innovation.

Within the common purpose, vision or strategy framework, innovations emerge from a variety of different sources. Customer and client needs and problems are the primary source of innovation. Beyond that technological developments trigger innovation. In this context in principle all staff had the chance to contribute to and influence strategic direction. There is a wide span, however, regarding the respective degree of influence exercised by management and by employees. In most of the heterarchies, strategy is developed as a combination of ex ante analyses and planning ahead on the one hand, and initiatives of an experimenting *ad hoc* character on the other, with an emphasis on the latter.

Processes-structures for innovation management in more heterarchical organisation

Of the five organisations in the study not one had an "official" innovation process to guide innovation. Across all the heterarchies, there is agreement that innovation is collective, it is everybody's responsibility. Everybody is responsible for developing further his/her focus area and aligning these with organisation strategic aims and objectives using the multitude of channels available. This understanding of the role of collective innovation in the organisation was clear in all those interviewed. In the classic view of innovation, some ideas are generated and systematically evaluated and selected on the basis of clear technology, given market related and company-specific criteria (Tidd and Bessant, 2013). In the heterarchies ideas to be pursued further emerge and are selected more based on "gut feeling" and gauging customer interest. In heterarchies there are a multitude of possible pathways for moving from an initial idea through to launch, which those involved would choose. In heterarchies the presence of "hierarchy" in processes-structures was evident in the continuing influence of the organisation founder. However, their influence appeared to be not based on position but more on experience, and their broader overview of inter-relations and knowing the customers and clients, meaning they are championing collective innovation.

Employees can make small or more fundamental improvements in their own areas, contribute to new products or to changes in strategy-direction or culture-leadership. Inefficiency associated with this kind of collective innovation, if it exists, may emerge in the discussion and experimentation involved in an innovation-friendly overall environment. The management challenge then is inversion of that in hierarchical organisation. Process-structures are needed need to "shelter" innovation in hierarchies or collective innovation gets shut down or killed off, whereas in heterarchies process-structure are needed to "shelter" efficiency.

Culture-leadership and innovation management in more heterarchical organisation

At the heart of all the heterarchies is a self-conception about working in an independent and self-directed way. This requires high levels of trust and exercising that autonomy at individual and team levels. Formal "managers", another aspect of hierarchy, may be present but where they were present, were expected to encourage people to take initiative and responsibility for innovation, employing a form of pull-principle; for people to choose the areas of engagement, rather than assigning responsibilities. Individuals become drivers of collective innovation in this way. Accepting responsibility means employee decision-making and bearing the consequences of those decisions.

A further condition for self-initiative and responsibility is that people trust each other. In the case organisations trust granted by leaders is seen in various ways; including enabling employees to potentially influence strategic direction; leaving organisational roles and processes relatively open for people to shape themselves; accepting that some ideas are realised in the shadow, with resources allocated to initiatives without approval “from the top”. In most of these cases organisation candidates are explicitly hired more for cultural fit or mind-set than for technical expertise or fit for a particular position. In four of the five cases, the teams finally decide who would fit in and thus be hired.

Discussion

The case and cross-case analysis of heterarchical organisations reveals what can be termed “responsible exposure” as the way that collective innovation is enabled. Where classic innovation management creates “shelter”, more heterarchical organisations have process-structure that create greater responsible exposure among teams and all individuals for collective innovation (See Figure 2). The practices of these heterarchies are not homogenous, and so cannot be simply contrasted directly with “classic” innovation management. It is possible and of value to explore aspects of a direct comparison.

More heterarchical organisations appear to dispense with the characteristics of centralisation and formalisation found in bureaucratic hierarchies. Alongside less formalisation and centralisation there are multiple channels for enabling collective innovation other than a formal innovation process. There is though no unique process-structure for collective innovation, with different organisations using different approaches. Some look like adhocracies with abiding agents of control (essentially the owners), others use key performance indicators and others have explicit strategy and some *ad hoc* initiatives or experimentation. The challenge is to manage freedom, initiative and responsible exposure and a culture, which enables and contains these.

As theory would suggest there are elements of hierarchy co-existing with self-organisation, as is evident in aspects of strategy-direction and culture-leadership in these heterarchies. Even so greater scope for independence in heterarchies amidst formal and centralised strategy-direction and culture-leadership exists, where guidelines derived from these offer a multitude of options rather than prescription in detail.

Most surprisingly, culture-leadership is not in itself the nexus of more enabling collective innovation in heterarchies. In the most distinctive of the heterarchies leadership still has the role of a moderator and connector between the firm and major stakeholders, and with regard to expectations about innovation overall. If the organisations founder had a strong entrepreneurial background and is still strongly involved in initiating and driving major

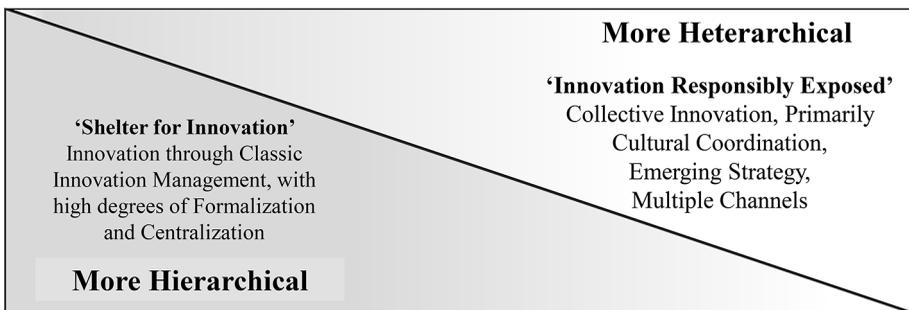


Figure 2.
Revised conceptual
framework

strategic initiatives, this seems to be the reality. This is double-edged for enabling collective innovation. On the one hand, their entrepreneurial spirit can be inspiring to others. On the other hand, taking such responsibility for innovation might be daunting for employees. The nature and influence of leadership in heterarchies seems to be variable, and how that might affect innovation is not entirely clear.

Conclusion

The three research questions considered here were:

- RQ1.* How is collective innovation managed in organisations that are authentically heterarchical?
- RQ2.* What process-structure, strategy-direction and culture-leadership practices are associated with collective innovation in these authentically heterarchical organisations?
- RQ3.* What kind of model might help describe the collective innovation of authentically heterarchical organisations?

On the first question, there is evidence that, as expected, collective innovation is enabled with a different look and feel to innovation management in hierarchical organisations. Across aspects that range from workplace and workspace design to the level of engagement of staff in innovation processes heterarchical values shape leadership styles and the emotional climate around innovation in a distinctive way. Rather than hierarchy embodying the value of control through fixed lines of authority heterarchies embody openness and inclusion in enabling innovation.

The answer to the second question, in the terms suggested here, is that more “responsible exposure” and less shelter is seen to influence how process-structure, strategy-direction and culture-leadership on the whole aligned are formed and work. The collective innovation practices found in more heterarchical organisation are neither radically new or “uniquely” or homogeneous. They process-structure practices for collective innovation are most distinctive and shared, but with a variety of strategy-direction and culture-leadership characteristics.

On the third question, of the existence of a kind of model to describe all this, two issues emerge. First, as seen in the data analysis, for most of the aspects of culture-leadership associated with being both innovative and heterarchical all these cases can be cited. Yet for many of the aspects of strategy-direction or process-structure only a few cases can be cited for each aspect. This may be interpreted to suggest there is a common model possible of culture-leadership but with variation in strategy-direction and process-structure for what can be legitimately called collective innovation in the heterarchical way. Or it may be concluded that this sample contains only some examples of the truly heterarchical-innovative organisation. Analysis and modelling needs to concentrate on those, including further research and cross-case analysis to focus on that strong form and organisation type. The second issue is, following this, the extent to which generalisation from the collective innovation of these more heterarchical organisation is possible with respect to the conceptual framework outlined at the outset of the paper. It is possible and reasonable, accepting the limitations of the sample as it stands, including the small sample of cases, to modify that initial conceptual framework as shown in [Figure 2](#).

In conclusion, collective innovation in more heterarchical organisation has been conceptualised and then explored in a sample of cases using cross-case analysis. There is more “responsible exposure” and less shelter in processes-structures, with strategy-direction and culture-leadership on the whole aligned with that responsible exposure. This does not mean

advocating that hierarchies become more heterarchical to better manage collective innovation. Heterarchy and hierarchy will continue to co-exist. The balance and blend of these to best access and engage the creativity and intelligence of employee through collective innovation can be rethought in various contexts. Contexts will vary, from fast-paced, competitive environments, with predominantly knowledge-intensive and non-routine tasks exposed to technological change, to those delivering basic services in forms and with resources that remain stable or indeed may be eroding. Learning about the more heterarchical organisation is one source of knowledge to review intelligently the strategies, structures and cultures, which best enable collective innovation. Organisations, which are and will remain more heterarchical may learn from these collective innovation practices. Even where collective innovation continues to need “shelter” from some aspects of strategy-direction and culture-leadership, in the form of separate innovation centres or units, there are lessons and applications.

References

- Anderson, C. and Brown, E.C. (2010), “The functions and dysfunctions of hierarchy”, *Research in Organizational Behavior*, Vol. 30, pp. 55-89.
- Bednall, T.C., Rafferty, A.E., Shipton, H., Sanders, K. and Jackson, C.J. (2018), “Innovative behavior: how much transformational leadership do you need?”, *British Journal of Management*, Vol. 29 No. 4, pp. 1-21.
- Bernstein, E. Bunch, J. Canner, N. and Lee, M. (2016), “Beyond the holacracy hype”, Harvard Business Review, available at: <https://hbr.org/2016/07/beyond-the-holacracy-hype?referral=00134> (accessed 12 February 2018).
- Bhargava, S. and Sinha, B. (1992), “Prediction of organizational effectiveness as a function of type of organizational structure”, *The Journal of Social Psychology*, Vol. 132 No. 2, pp. 223-231.
- Blau, P.M. and Page, C.H. (1968), *Bureaucracy in Modern Society*, 17th ed., Random House, New York, NY.
- Brown, S. and Eisenhardt, K. (1995), “Product development: past research, present findings, and future directions”, *The Academy of Management Review*, Vol. 20 No. 2, p. 343.
- Cameron, K.S., Quinn, R.E., Degraff, J. and Thakor, A. (2006), *Competing Values Leadership*, Edward Elgar, Cheltenham.
- Colombo, M.G., von Krogh, G., Rossi-Lamastra, C. and Stephan, P.E. (2017), “Organizing for radical innovation: exploring novel insights”, *Journal of Product Innovation Management*, Vol. 34 No. 4, pp. 394-405.
- Cooper, R. (2013), *Winning at New Products: Creating Value through Innovation*, Basic Books, New York, NY.
- Crumley, C.L. (2008), “Heterarchy and the analysis of complex societies”, *Archeological Papers of the American Anthropological Association*, Vol. 6 No. 1, pp. 1-5.
- Crumley, C.L. (2015), “Heterarchy”, in Scott, R.A. and Kosslyn, S.M., (Ed.) *Emerging Trends in the Social and Behavioral Sciences*, Wiley, New York, NY.
- Cumming, G.S. (2016), “Heterarchies: reconciling networks and hierarchies”, *Trends in Ecology and Evolution*, Vol. 31 No. 8, pp. 622-632.
- Damanpour, F. (1996), “Bureaucracy and innovation revisited: effects of contingency factors, industrial sectors, and innovation characteristics”, *The Journal of High Technology Management Research*, Vol. 7 No. 2, pp. 149-173.
- Damanpour, F. and Aravind, D. (2012), “Managerial innovation: conceptions, processes, and antecedents”, *Management and Organization Review*, Vol. 8 No. 2, pp. 423-454.
- Davies, M.I.J. (2009), “Wittfogel’s dilemma: heterarchy and ethnographic approaches to irrigation management in eastern Africa and Mesopotamia”, *The Archeology of Water*, Vol. 41 No. 1, pp. 6-35.

-
- Degraff, J. and Quinn, S.E. (2007), *Leading Innovation*, McGraw Hill, New York, NY.
- Diefenbach, T. and Sillince, J.A.A. (2011), "Formal and informal hierarchy in different types of organization", *Organization Studies*, Vol. 32 No. 11, pp. 1515-1537.
- Flick, U. (2014), *Qualitative Research*, 6th ed., Rowohlt, Hamburg.
- Gibb, S. and Burns, C. (2018), "Organization values-behaviour interrelations in work organizations; integrating the positive, ambivalent and negative", *Journal of Human Values*, Vol. 24 No. 2, pp. 1-11.
-
- Goffin, K., Herstatt, C. and Mitchell, R. (2009), *Innovation Management*, FinanzBuch Verlag, Munich.
- Gupta, P. (2011), "Leading innovation change – The kotter way", *International Journal of Innovation Science*, Vol. 3 No. 3, pp. 141-150.
- Hamel, G. (2007), *The Future of Management*, Harvard Business School, Boston.
- Hamel, G. (2011), "First, let's fire all the managers", Harvard Business Review, available at: <https://hbr.org/2011/12/first-lets-fire-all-the-managers> (accessed 12 January 2019).
- Harrington, H. and Voehl, F. (2013), "Innovation management: a breakthrough approach to organizational excellence – part 1", *International Journal of Innovation Science*, Vol. 5 No. 4, pp. 213-224.
- Hartnell, C.A., Ou, A.Y. and Kinicki, A. (2011), "Organizational culture and organizational effectiveness: a meta-analytic investigation of the competing values framework's theoretical suppositions", *Journal of Applied Psychology*, Vol. 96 No. 4, pp. 677-694.
- Hauschildt, J. and Salomo, S. (2011), *Innovation Management*, 5th ed., Vahlen, Munich.
- Hedlund, G. (2005), "Assumptions of hierarchy and heterarchy, with applications to the management of the multinational corporation", in Ghoshal, S. and Westney, D. (Eds) *Organization Theory and the Multinational Corporation*, 2nd ed., Palgrave Macmillan, Basingstoke, pp. 198-221.
- Hoepfl, H.M. (2006), "Post-bureaucracy and weber's 'modern' bureaucrat", *Journal of Organizational Change Management*, Vol. 19 No. 1, pp. 8-21.
- Jaakkola, E. and Hallin, A. (2018), "Organizational structures for new service development", *Journal of Product Innovation Management*, Vol. 35 No. 2, pp. 280-297.
- Keum, D. and See, K. (2014), "The influence of hierarchy on idea generation and selection in the innovation process", *Organization Science*, Vol. 28 No. 4, pp. 653-669.
- Kumar, S.V. and Mukherjee, S. (2018), "Holacracy – the future of organizing? The case of zappos", *Human Resource Management International Digest*, Vol. 26 No. 7, pp. 12-15.
- Leavitt, H.J. (2003), "Why hierarchies thrive", *Harvard Business Review*, Vol. 81 No. 3, pp. 96-102.
- Litchfield, R.C., Karakitapoğlu-Aygün, Z., Gumusluoglu, L., Carter, M. and Hirst, G. (2017), "When team identity helps innovation and when it hurts: team identity and its relationship to team and cross-team innovative behavior", *Journal of Product Innovation Management*, Vol. 35 No. 3, pp. 350-366.
- Liu, X., Magjuka, R. and Lee, S. (2008), "An examination of the relationship among structure, trust, and conflict management styles in virtual teams", *Performance Improvement Quarterly*, Vol. 21 No. 1, pp. 77-93.
- McCulloch, W.S. (1965), "A heterarchy of values determined by the topology of nervous nets", in McCulloch W.S. (Ed.), *The Embodiment to Mind*, MIT Press, Cambridge, MA.
- Mintzberg, H. (1979), *The Structuring of Organizations*, Prentice-Hall, Englewood Cliffs.
- Morton, S.C., Brookes, N.J., Smart, P.K., Backhouse, C.J. and Burns, N.D. (2004), "Managing the informal organisation: conceptual model", *International Journal of Productivity and Performance Management*, Vol. 53 No. 3, pp. 214-232.
- Pfeiffer, S., Schuett, P., Wuehr, D., et al. (2012), "Innovation in lines? The standardization of innovations", in Pfeiffer, S. (Ed.), *Smart Innovations: Results and New Approaches in Mechanical and Plant Engineering*, Springer, Berlin, pp. 99-118.

-
- Reihlen, M. (2009), "Leadership in heterarchy", in Albers, S. and Reihlen, M. (Eds) *Integrated Management of Value Generating Networks*, Kölner Wissenschaftsverlag, Köln, pp. 75-111.
- Santini, R.H. and Moro, F.N. (2019), "Between hierarchy and heterarchy: post-Arab uprisings' civil-military relations and the arab state Mediterranean politics", *Mediterranean Politics*, Vol. 24 No. 2, pp. 137-156.
- Sarooqhib, H., Libaersa, D. and Burkemperb, A. (2015), "Examining the relationship between creativity and innovation: a meta-analysis of organizational, cultural, and environmental factors", *Journal of Business Venturing*, Vol. 30 No. 5.
- Savage, G., Franz, A. and Wasek, J.S. (2019), "Holacratic engineering management and innovation", *Engineering Management Journal*, Vol. 31 No. 1, pp. 8-21.
- Schoenherr, J.R. and Dopko, R.L. (2019), "Heterarchical social organizations and relational models: understanding gender biases in psychological science", *Theory and Psychology*, Vol. 29 No. 2, pp. 258-281.
- Scott, T., Mannion, R., Davies, H. and Marshall, M. (2003), "The quantitative measurement of organizational culture in health care: a review of the available instruments", *Health Services Research*, Vol. 38 No. 3, pp. 923-945.
- Semler, R. (2001), *Maverick*, Reissue edition, Random House Business, New York, NY.
- Spelthann, V. and Haunschild, A. (2011), "Organizational creativity in heterarchies: the case of VFX production", *Creativity and Innovation Management*, Vol. 20 No. 2, pp. 100-107.
- Stark, D. (2009), *The Sense of Dissonance*, Princeton University Press, Princeton.
- Steiber, A. and Alänge, S. (2013), "A corporate system for continuous innovation: the case of google inc", *European Journal of Innovation Management*, Vol. 16 No. 2, pp. 243-264.
- Stern, T. and Jaberg, H. (2010), *Successful Innovation Management*, Springer, Berlin.
- Talbot, C. (2008), *Measuring Public Value: a Competing Values Approach*, The Work Foundation, London.
- Taylor, D., King, R. and Smith, D. (2019), "Management controls, heterarchy and innovation: a case study of a start-up company, accounting", *Accounting, Auditing and Accountability Journal*, Vol. 32 No. 6, pp. 1636-1661.
- Tidd, J. and Bessant, J. (2013), *Managing Innovation*, 5th ed., Wiley, New York, NY.
- Trusko, B.E. (2017), "Guest editorial", *International Journal of Innovation Science*, Vol. 9 No. 4, pp. 318-319.
- Tushman, M.L. and O'Reilly, C.A. (1996), "Ambidextrous organizations: managing evolutionary and revolutionary change", *California Management Review*, Vol. 38 No. 4, pp. 8-29.
- Vahs, D. and Brem, A. (2013), *Innovation Management*, 4th ed., Schaeffer-Poeschel, Stuttgart.
- Wang, F. (2010), "The evolution of hierarchy toward heterarchy: a case study on baosteel's managerial systems, frontiers of", *Frontiers of Business Research in China*, Vol. 4 No. 4, pp. 515-540.
- Wolf, H. (2011), "Beyond planning and control; alternative approaches in industrial management research and development", in Jeschke, S. (Ed.) *Enabling Innovation*, Springer, Berlin, pp. 35-46.

Further reading

Ries, E. (2017), *The Lean Startup*, Portfolio Penguin, London.

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