

Knowledge and Creativity Management: Is it a Boost or a Limit for Healthcare in the Post-covid World ?

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Abstract: Knowledge Management (KM) and Creativity Management (CM) are increasingly linked to the analysis of healthcare management. The health management of the Covid 19 emergency has amply demonstrated how these two frameworks, which are widely debated in the literature, find practical operational feedback albeit with profound lights and shadows. This study aims to investigate the contributions and threats of KM and CM within the context of local healthcare in order to highlight, using a quantitative methodology, which variables impact healthcare management the most and which variables are negligible. The analysis conducted concerns a sample of 200 healthcare workers from one of the Italian regions that has been most affected by the pandemic and will show how quickly healthcare management has changed in terms of internal procedures and relationships with stakeholders, subverting the paradigm of "rational planning" connected to typical CM variables.

Keywords: Knowledge Management, Creativity, Healthcare Management

1. Introduction

In recent years, the healthcare system has been changed by notable pushes towards the introduction of managerial models (Berardi et. al, 2022; Cepiku et. al, 2021). If we considered the situation a few years after the change process, the result is a made up of positive and negative factors.

The positive factors undoubtedly consist in the fact that we hear more and more about management control, budgeting, reporting and so on, and that after so many words the first concrete applications of these tools are starting to appear. To these positive factors, however, we must add a substantial series of negative factors; we refer in particular to these facts:

- the new management along with its control tools have been interpreted mainly as a method to reduce and cut costs (Boyne, 2001);
- little attention has been paid by management models to the effectiveness and healthcare quality (Di Vincenzo et. al, 2022) ;
- as a consequence of this, the medical component, despite having to play a primary role in the application and use of these tools, has ended up being the great exclusion in many cases (Crosby et. al, 2017).

The limits just mentioned certainly constitute a valid stimulus to reflect and rethink healthcare management models and tools regarding most recent studies regarding creative management in the intelligent management of business processes (Kamara et al., 2002).

Part of the international literature highlights the need to combine traditional models of management and control of business processes with analyses focusing on the quality of the services offered considering the ability of healthcare workers to adapt to social and economic changes (Heeks, 2002 and 2003).

On this topic, the literature has highlighted how the COVID-19 pandemic represented the catalyzing event towards a process of profound rethinking in the management of public health.

While on the one hand the New Public Management has introduced the concept of rational planning (indicator) and achievable (target) objectives, the emergence of extraordinary and often unpredictable events have led the public-healthcare system to review the traditional programming levers by introducing new variables such as unconditional trust towards healthcare workers (trust) and the management of the unexpected on a par with so-called ordinary management (Sternberg et a., 1997).

In this scenario, the ability to adapt and creativity of healthcare workers represents the lever that allows critical issues to be overcome. Creativity and passion are of particular relevance to mission and vision statements. A

simple definition of creativity is the power or ability to invent. We sometimes think of creativity as being a purely artistic quality, but creativity in business is the essence of innovation and progress (Sargiacomo et al., 2021).

Defining passion we intend an intense feeling or conviction. Passion is also associated with intense emotions. This means that a point of view should reflect and communicate something that is relatively novel and unique, and such novelty and uniqueness are the products of creativity and passion (Robinson et. al, 2008).

On this topic, international literature has shown how the management of the COVID-19 health emergency was brilliantly overcome thanks to the creativity and passion of healthcare workers who, through the re-engineering of healthcare action plans (knowledge management in practice) led to the innovation of traditional managerial models.

On these premises, our paper will analyze the changed context of the management of health services through the field analysis of one of the Italian contexts hit by the COVID-19 pandemic event, namely the Abruzzo region. Our same reference context has in fact been the subject of numerous studies on the topic and even the international database "WHO Covid 19" has indexed numerous contributions on this topic. In this regard, as confirmed by the literature, although the Abruzzo population represents only 4% of the Italian population, the impact of the pandemic has literally exhausted the local healthcare system and only the profound dedication and creativity in managing the pandemic has allowed us to react very quickly to the health emergency (Papi et al., 2018).

By applying a quantitative methodology to the context of healthcare in Abruzzo, this work aims to answer the fundamental research question: what is the role of creativity management and knowledge management in the healthcare system?

To answer the research question, we structured the paper as follows: the literature review constitutes the link between Knowledge Management (KM) and Creativity Management (CM); the methodological section will describe the methods and times of the investigation we conducted in order to investigate the strengths and weaknesses of the reference frameworks. Finally, through the analysis of the results we will show the efforts made by the healthcare sector and how the new approach adopted has revolutionized the traditional management of public healthcare management. These conclusions will outline the limitations of our research, the weaknesses of the model adopted and provide ideas for further studies.

2. Literature Review

Creating value is the primary objective of a company and the managerial tools, behaviors and actions of each operator are inspired by this model. For healthcare companies, the value creation model can be valid as long as it considers the peculiarities that characterize these companies. If creating healthcare value can become the strategic objective of a healthcare company, it is essential, at this point, to evaluate which are the key variables appear to be the paths for creating value.

The old management "tools" such as budgeting and reporting can be enriched from this perspective and constitute an excellent support for all operators, first and foremost for the medical profession, which for various reasons was in the past and still is today more reluctant and less involved in the use of these tools. The value creation model can become the underlying philosophy which inspires all healthcare management tools and can constitute the common language to facilitate meeting, dialogue and comparison of the different professionalities and cultures that coexist within healthcare companies.

In this regard, part of the traditional doctrine identifies the "Knowledge Management Cycle" as the ideal approach to creating healthcare value (figure 1). Knowledge management is commonly defined as the strategic and organized approach aimed at identifying, capturing, storing, organizing and distributing knowledge within an organization. The main objective of this approach is therefore to maximize the use of available intellectual resources, to improve operational efficiency and to promote innovation.

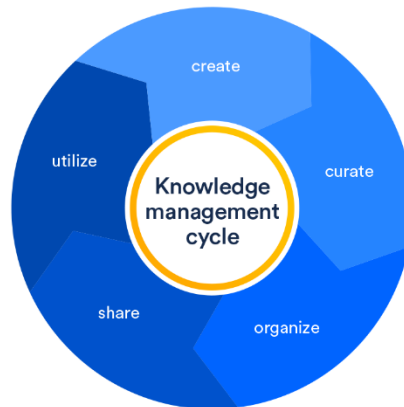


Figure 1: Knowledge Management Cycle (Machlup and Drucker,1978)

The knowledge management approach requires a series of activities to be put into practice: they range from the identification of knowledge to the evaluation and measurement of its effectiveness. Performing these activities perfectly, however, is not necessarily a guarantee of success: knowledge management is truly effective when it is supported by the creation of an organizational culture that promotes knowledge sharing, continuous learning and innovation.

It is therefore not enough to collect and share company knowledge, but it is necessary to convey the message at all levels that knowledge sharing is an essential part of the success of every company activity (Al Ahabbi, 2019; Capolupo et al., 2023). Thanks to knowledge management, the knowledge and skills attributable to this knowledge are not the exclusive relevance of a few, but become accessible to all. Having this fundamental advantage linked to knowledge management , it is also possible to identify other factors that are a direct consequence of:

- Improved productivity - as a strategic and structured approach, knowledge management allows for efficient management of information and, consequently, reduces the time needed to find answers or solve problems, thus supporting the organization's productivity.
- Risk reduction - the collection and sharing of knowledge can also support the identification and effective management of risks, as having access to accurate documentation of crucial information allows you to make informed decisions and potentially prevent, costly mistakes .
- Quality improvement - through the sharing of best practices it is in fact possible to facilitate the continuous improvement of operations and the general quality of its products and services.
- Skills development - the systematic sharing of company knowledge also allows for continuous training and the development of the skills of its collaborators, who can easily access training materials to improve their professional skills.
- Preservation of company know-how - thanks to knowledge management it is possible to share specific knowledge, possessed only by collaborators who carry out a particular activity and which would risk being lost with staff rotation.
- Support for Innovation - it may seem obvious, but it is of fundamental importance to share past experiences and solutions that can stimulate new ideas and innovative approaches.

Therefore, it is clear how knowledge management can significantly contribute to the success and growth of an organization by improving operational efficiency, stimulating innovation and allowing organizations to preserve and transmit the fundamental know-how to carry out their activities (Battiston et al., 2020; Capolupo et al., 2023).

At the same time, this approach is not particularly effective where extraordinary events, for example the COVID-19 pandemic, compromise the natural course of events by jamming the gear of the "Knowledge Management wheel". In these cases, the human capital of corporate organizations represents "The key that unlocks the chain". As is known, the behaviors of people are characterized by numerous variables including: the predisposition to sacrifice, to teamwork, along with the previously gained experiences.

All things being equal, the literature highlights the creativity of individuals (creativity management theory) as the ability to overcome any corporate critical issues and guarantee the creation of corporate value. The health care

industry needs creativity and innovation to address challenges with quality, safety, cost, and access to care through the development and implementation of new or improved policies, processes, systems, products, technologies, diagnoses and treatments, services, and care delivery methods (Amabile, 1990). In this sense, creativity management is a system of principles, methods, techniques, practices, and instruments for managing employee creativity to get the maximum effect for the organization according to its goals, objectives, employee contingent, and available resources (Amabile; 1996; Ambabile et al., 2014; Al-Husseini, 2024).

Regarding creativity management literature (Patwary et al., 2024; Lubart, 2017) evidence on “the 7C’s the core” create a strong foundation to relate in a more mindful way. More specifically:

- Curiosity: we know that we don’t know everything and that we can’t know everything. When we reconnect with our curious side and practice being open to whatever we find.
- Cognition: By taking the time to explore our thoughts, we can also explore why we perceive, reason and understand in the way we do. As we learn to look at our thoughts, feelings and responses from a more objective point of view, we can begin to see things with greater clarity and understanding and how context can impact our words, actions and decisions;
- Compassion: when we’re compassionate, we decide to accept and engage with ourselves and others with kindness, without judgement, reaction or disengagement. Learning how to engage with ourselves and knowing which strategies we can use to take a gentler approach when times get tough is so important;
- Cultivation: We know learning a new skill or practice can be a messy one, with ups, downs, setbacks and breakthroughs; we get the most out of committing to something when we are able to do so in a consistent but flexible way. Creating meaningful changes can lead to genuinely profound shifts in perspective and behaviour and they take time, practice and patience;
- Celebration: a lot of the time we are so focused on the result, we overlook how far we have come. When we celebrate our achievements, we acknowledge and honour our effort, creating positive feedback loops that keep us motivated when times inevitably become difficult. Learning how to celebrate the journey allows us to experience more joy and gratitude;
- Community: the community is so important in our lives as in community, we find encouragement, accountability, and diversity. Having awareness of our strengths and knowing what we can offer others is so valuable. Being part of a community creates a more compassionate and curious culture where we can foster a sense of openness and kindness together, whilst reducing judgement and increasing tolerance;
- Connection: it’s how we build relationships, understanding and behavior. If we can connect to ourselves, others, and the world around us with understanding and compassion, we can fill the empty spaces in relationships.



Figure 2: Creativity Management 7C’s (Lubart,2017)

The combination between a knowledge management (KM) and creativity management (CM) approach appears to have been the winning key for overcoming traditional approaches to healthcare management in the period preceding the pandemic emergency. The creation of healthcare value was in fact the final product of a "team game" involving a large series of variables, whose behavior was coordinated and balanced in a synergistic way. In particular, the variables of the model are divided among themselves according to a dual criterion:

- causal, whereby final health state objectives are identified (value for users), and intermediate (or instrumental) objectives aimed at achieving the former, and therefore logically connected to them by a cause/effect relationship that management it must necessarily presuppose.
- temporal, in the sense that the pursuit and realization of value creation requires a balance between actions whose effects will materialize in a short-term time frame, and medium-long term objectives aimed at preparing the conditions to guarantee in the long term the ability to create value. This category includes objectives linked to innovation and skills development projects, research, and the training of resources, the effects of which on the state of health of the population will not be seen immediately, but over a broader time lapse.

The value model thus articulated constitutes a conceptual structure that is no longer static and must not be translated through management support tools and mechanisms.

For this purpose, traditional programming and control "tools" can be profitably used, reviewed and re-calibrated with a view to creating value. This instrumentation has traditionally been based on a very simple logic: it is necessary to plan (first establish which results one intends to achieve) and control the management (then check whether the results being achieved are in line with the expected ones).

In particular, the theory of rational planning (Berardi et. al, 2021; Capolupo et. al, 2023) involves setting objectives and planning commitments and activities, to realize in advance, the possible problems that may be encountered and therefore study the countermeasures and solutions. Subsequently, while management, ascertain whether "things are going as expected", i.e. whether management is taking place in accordance with plans, to promptly realize the need to adopt appropriate corrective measures. Finally, verify in the final analysis whether the actual results corresponded to the planned ones, to "calibrate the aim better" in the development of subsequent programs.

The effort made by healthcare professionals (managers and employees) with respect to this general model we must adapt this formula to the logic of value, filling tools such as the definition of strategic objectives, the budget, reporting with specific contents.

Although COVID-19 has shocked the world and has hit most countries, businesses, and individuals unprepared, this sudden disruption has forced many of them to come up with innovative solutions and improvise, mainly to tackle the health emergency. While the health risks are currently the most frightening and upsetting, the social and economic crisis has vastly "resetted everything" (Berardi et. al, 2021).

3. Methodology

Considering previous literature, we focus our study on the same geographical area that has been investigated by other authors such as Battiston et al. (2021), Marziano et al. (2021) Berardi et al. (2021b, 2022) to provide more details that can contribute to a better understanding regarding how the public policy has affected local authorities. In the period between September 2023 and January 2024 we conducted 190 interviews with public employees from all the 4 main local healthcare districts (ASL), divided into the three macro categories: Deputy Employees (150 interviews), Managers (30), Senior Managers (10). Those four health hubs are the largest in terms of total customers of the Abruzzo Region (296.130 inhabitants in the four municipalities over 1.312 million of total inhabitants of the entire region) and have been largely investigated by Italian literature (Sebastiani et al., 2020; Berardi et al., 2021).

Table 1: Demographic characteristics of the respondents

Employee	Deputy Employee (150)		Managers (30)		Senior Managers (10)	
	Frequency	%	Frequency	%	Frequency	%
Age						
18-30						
31-44	10	6				
45-59	115	76	25	83	10	100
60 - 79	25	18	5	17		

Employee	Deputy Employee (150)		Managers (30)		Senior Managers (10)	
	Frequency	%	Frequency	%	Frequency	%
80+						
Gender						
M	90	60	25	83	8	80
F	60	40	5	17	2	20
Education						
No schooling completed						
Nursery school to 8 year grade						
High School	120	80			8	80
Bachelor or master's Degree	30	20	30			
<i>Phd</i>					2	20

In Table 1 we report the demographic profile of the respondent. Starting from this dataset we extract from interviews our dependent variable (Y) called “Knowledge and Creativity Contribution” computed as the use of new procedures inducted by national policies on digitalization of procedures to achieve smart governance (Vial, 2019). Such a variable was based on prior studies and used a validated single item measure (de Jong & den Hartog, 2010; Mascia & Cicchetti, 2011), by asking them: “how has your creativity influenced the response of your structure to the community needs in terms of healthcare?”.

This measure captured the effectively effort of creativity on KM procedures introduced in the local body with responses on a five-points scale, ranging from 1 (never) to 5 (very frequently). We chose this variable considering the impact that the central government acts (derived to the legislative decree 18/2020) had on the introduction of KM paradigms and logics in the healthcare sector. The dependent variables reconduct to Creativity variables as identified by international literature (Ramirez, 2020) and illustrated in table 2 in coherence with the process phase of the “knowledge management toolkit” (Robinson et al., 2010) measured with a Likert scale 0-5.

Table 2: Research items of the process phase of the C7’s items

Process research Items	Deputy employee	Managers	Senior Managers
	Likert scale average	Likert scale average	Likert scale average
Curiosity and cognition	2	4.66	4.66
Community and Connection	1	5	5
Cultivation, Compassion and Celebration	1	3	3

Once the indicators were defined, the following regression model was applied (OLS) to consider all the variables included in the survey (Berardi et. al, 2021). In the equation below, Y represents the dependent variables, α represents the constant of the model, β represents the coefficient of the estimation of the variables (independent variables), \log_{xni} represents the logarithmic conversion of the variables measured with a Likert scale 0-5 (Table 2), while ϵ represents the standard error (Berardi et. al, 2022). The logarithmic conversion of some variables has been applied to reconduct the model to a Gaussian distribution. As a result, we build up three different regression models considering the three different clusters of interviews:

- a) Deputy employee’s C’7s model: $YDE = a + \beta x_1 + \beta \log x_2 + \beta \log x_3 + \beta x_4 + \beta \log x_5 + \beta \log x_6 + \epsilon_i$;
- b) Manager’s C’7s model: $YM = a + \beta x_1 + \beta \log x_2 + \beta \log x_3 + \beta x_4 + \beta \log x_5 + \beta \log x_6 + \epsilon_i$;
- c) Senior Manager’s C’7s model: $YSM = a + \beta x_1 + \beta \log x_2 + \beta \log x_3 + \beta x_4 + \beta \log x_5 + \beta \log x_6 + \epsilon_i$;

The combination of the 6 variables which were considered showed no problems related to heteroskedasticity in all the three models (Breusch–Pagan tests results: $\chi^2 = 0.03$; Prob> $\chi^2 = 0.796$) and specificity (Ramsey test results: $F(1.45) = 0.78$; Prob> $F = 0.337$), as well as autocorrelation of some variables. Therefore, it was not necessary to proceed through stepwise regression (Shapiro–Wilk test results: pvalue= 0.698).

4. Results

What emerges from the analysis of the results, and answering to rq1, is a misalignment between employees and managers contribution on creativity and digitalization to the creation of public value. As shown in table 3 the YDE model is completely irrelevant for our analysis, as it has shown non-significant results while YM and YSM models reflect exactly the opposite situation.

Table 3: Results of the OLS regression, Source: Authors’ own Table (2024)

Item	Regressor	YDE	YM	YSM
Curiosity and cognition	x1	-1,187 (0,245)	3.274 (1.988) *	3.172 (1.978) *
	logx2	0,137 (1,287)	6,846 (1,903) **	6,786 (1,897) **
	logx3	-1,481 (1,377)	8,133 (2,003) ***	7,983 (1,992) ***
Community and Connection	x4	-1,876 (0,345)	4,179 (2,078) *	3,879 (1,578) *
	logx5	-2,385 (2,273)	6,074 (1,738) *	5,874 (1,684) *
Cultivation, Compassion and Celebration	logx6	-3,175 (1.548)	2,507 (1,887) **	2,498 (1,787) **

To better understand the sense of this static approach we report some extracts from the interviews conducted in the data set. In reference to the research item Community and Cognition, we asked them: “Are the measures adopted in line with the goal of achieve a digital environment?” while the managers just answered with no doubt that they are operating in the right direction, most of the employees specified that: “we are just doing what they asked us to do with absolutely no knowledge about what was going on. We are acting in the old way but with new sophisticated tools and instruments. Honestly, most of us are still having problems on procedures as they had a real lack back knowledge about Information Technologies. We have just received some basic commands and we move one step by step. This aspect had a terrible impact on our productivity because we must help those who are still having a problem after at least two years of the introduction of these new procedures. Moreover, many of us are afraid about the consequences of making an error so we spent a lot of time on re-check all the phases of the single processes. Only the sense of morality and the need to save lives helped us to move on to overcome all the issues”.

Another relevant discordant point can be found in the measurement of the outcome or, in other terms, about the impact that the new procedures are having on the benefits for citizens and stakeholders (Bonner, 2023). What emerges from interview is that managers have a more long-range point of view about the outcome on communities:

For the first time in over 30 years of work experience, we have truly served our community. Every day, we found ourselves having to face completely different problems and situations and only our empathy and desire to help others in order to guarantee an efficient service to the community allowed us to overcome the traditional rigidities of the national healthcare system. At times, likely, we also broke some laws but faced with the need to save human lives, common sense prevailed over the rigidity of the procedures”.

The extract of interviews, and the analysis we conducted, clearly show that while the managerial area of healthcare local bodies contributes to preserving the creative steam, the employees almost reject innovation, declining all the positive effects that it should have on their daily routine, thus confirming the second paradigm proposed by Rangarajan (2008). This creates a “no return way” in the process of creating public value in terms of user value, value to wide stakeholders or “value to wilder society” and basically let the achievement of public value as you are not in the condition of measure the real outcome on stakeholders, or at least to have no impact on them.

Innovation in the public health systems is taking several forms. For instance, video consultations and online consultations are now becoming regular practice for dealing with patients. This practice is rapidly taking hold in both acute and primary care, although it would have taken years to establish it in ordinary circumstances. Other examples are the test to diagnose breathlessness which has been introduced as soon as the emergency erupted or apps that trace the movement of infected patients and monitor their health condition. This fast transition brings certain risks such as data privacy risks or digital divide due to the limited access to health care of those parts of populations that lack digital connection. This aspect represents just some examples of the contribution of KM and CM that contribute to the rethinking of healthcare management that were emerges throughout the interviews conducted.

5. Conclusions

In this paper we highlighted a grey area still concerns the organizational design solutions related to creativity within the general context of generating new ideas. There is indeed a lack of literature in investigating the contribution of creativity and knowledge management. With this study we explored just one dimension of the policy making process that considers a knowledge management approach, also considering that the data set that we referred to only considers the public bodies organization of just one Italian Region that represent only the 5% of the Italian Population.

On the other hand, we give a first contribution on this topic showing that in a complex organization constituted by employees, managers, and senior managers, the process of creativity is completely different in the three different categories in order to contribute to international debate on KM and CM (Al-Husseini, 2023; Patwary et al., 2024). The results of the OLS regression are emblematic and confirm that the process of creativity is strictly correlated on different levels and attitudes as supposed by several authors (Rangarajan, 2008; Boyne, 2001; Hood, 1991; Amabile, 1996). Moreover, creativity positively affects the creation of value only when there is an alignment between the entire technostructure that gives the possibility to properly measure the impact of the adopted policies and measures.

In our opinion the key element of this study is that no matter where you live, or your income level, healthcare is ripe for change. According to international literature (Saulais et al., 2012), the state of health in the future will be radically better, but only if we create a favorable environment for implementing and adopting health innovations. Innovation within public and private healthcare entities is becoming both mandatory and vital and will be boosted by the creativity and knowledge of healthcare managers.

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