Municipalities, Innovation and Resilience

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Abstract

The focus of this paper lies on the potential of innovations carried out at the municipal level during crises to strengthen their resilience. It aims at understanding innovation-based mechanisms and their contribution to local resilience better. Examples of municipal innovations performed during the COVID-19 crisis are considered. This allows drawing some observations making the link between municipal innovations and local resilience to crises. The paper concludes with a research agenda linking municipal innovations and local resilience.

Keywords

Municipal Innovations, Resilience, Crises, COVID-19, Foresight

1. Introduction

The COVID-19 pandemic had a lasting impact on our lives. The restrictions engendered by this crisis were particularly acute at local level. The extent to which local institutions were unprepared for such an exceptional situation became clear. However, the crisis also showed considerable creativity in local authorities, and it became clear that this potential was put to good use.

Crises, which are often difficult to predict, seem to be becoming a "new normal". Extreme weather events, threats to critical infrastructures, waves of migration, pandemics, blackouts due to power grid overload or the direct consequences of hybrid conflicts are now realistic crisis scenarios. It cannot be ruled out that dangers of a hitherto unknown nature will also emerge.

At first glance, considering all these potential threats and the catastrophic consequences they could have is particularly worrying. However, the analysis of the COVID-19 crisis also demonstrates that mechanisms to counter or minimize the negative consequences of such extreme situations can be developed locally.

The focus of this paper lies on the potential of innovations carried out at the municipal level during crises to strengthen their resilience. It aims at understanding innovation-based mechanisms and their contribution to local resilience better.

The structure of the paper is the following. As a starting point, examples of municipal innovations performed in a small German town during the COVID-19 crisis are considered. This allows drawing some observations in the second section making the link between municipal innovations and local resilience to crises. The final section is devoted to the presentation of a hopefully promising research agenda.

2. Three Examples of Municipal Innovations Performed in a Small German Town during the COVID-19 Crisis

This section presents a series of actions implemented during the pandemic by municipalities in Baden-Württemberg, based mainly on first-hand observations in the municipality of Renchen[1]. The choice of the examples in question is subjective. These observations are not intended to be exhaustive of the different solutions adopted by all the municipalities in Baden-Württemberg, but to demonstrate that a wide range of areas were affected by the crisis, and that new solutions were developed consequently.

2.1. Setting up Municipal Crisis Units

The sudden onset of the health crisis in the spring of 2020 came as a shock to the population and municipal administration of Renchen, as it did throughout Europe. The municipal authorities very quickly set up a crisis unit, which launched a number of initiatives. The issues at stake were many and varied. For instance, these included ensuring food security for vulnerable populations, continuing school activities and, more generally, assisting vulnerable people. Above all, it was a question of pooling available information, securing funding and mobilizing resources.

The municipality set about adjusting its administrative structure as quickly as possible to cope with the pandemic. A hybrid structure was created, essentially consisting of a cell made up of representatives from all the municipality's administrative departments and representatives of the other organizations providing services of general interest (such as water supply and sewage disposal).

A coordination of the activities between these very different organizations is not taking place usually, and, above all, does not occur in a fast-paced decision-making mode. The aim was to enable close interactions in all areas affected by the crisis.

[1]The town of Renchen (Baden-Württemberg) is located in the western part of the federal state of Baden-Württemberg, in the district of Freiburg im Breisgau. It is close to the French border and has a population of around 7500. The choice of Renchen for this article was guided by the fact that, during the pandemic, one of the authors was at the heart of the decision-making mechanisms involved, in charge of the administrative and financial management of all municipal services.

An essential element of this approach was to regularly inform the town council, as the decision-making authority, of the measures taken. As town council meetings could no longer be held face-to-face, the legal framework was adapted to make remote decision-making possible. In fact, with the agreement of the elected representatives, it proved necessary to bypass a series of legal obstacles that would have made any decision impossible (Kommunal, 2022). Thus, on a weekly basis, the municipality was not only able to take effective measures quickly, but was also able to provide the population and local businesses with relevant information regularly. In particular, a dedicated web service was set up for all questions relating to COVID within the municipality. This structure enabled the municipality to continue to carry out most of its day-to-day activities to a satisfactory degree, despite the crisis situation.

2.2. Accelerating the Digitization of Schools

In Baden-Württemberg, municipalities are by law individually responsible for the maintenance of school buildings and related infrastructure, independently of teaching activities (which are the responsibility of the State Ministry of Education). This means that municipalities are also responsible for the digital equipment of schools (Sixt et al., 2019). Prior to the closure of the schools in March 2020, school education was delivered almost exclusively face-to-face, and generally speaking Germany as a whole ranked poorly internationally in terms of school digitization (Bundesministerium für Wirtschaft und Energie, 2021).

As the pandemic made face-to-face teaching impossible, local authorities had to react quickly. Financial resources were made available by the federal and state governments for the purchase of mobile terminals and e-learning licenses. However, the biggest problem for local authorities was the lack of IT staff at local level. Nationwide, a representative survey showed that the digitization of school education progressed during the pandemic. However, only 57% of teachers surveyed said they had sufficient IT equipment, only 29% said rooms were adequately equipped, and only 70% had a Wi-Fi connection (Gewerkschaft Erziehung und Wissenschaft, 2021).

In the case of the municipality of Renchen, in addition to the massive and accelerated purchase of IT equipment of all types in a context made difficult by the rapidly rising demand on a European scale, the bulk of the physical and virtual deployment of this equipment was made possible by the mobilization of trainees and apprentices (under the guidance of the specialist staff available).

Without these accelerated purchasing procedures, and above all without this emergency mobilization, pupils and teachers would have suffered even more from the pandemic.

2.3. Actions to Enhance Public Safety

As early as March 17, 2020, the government of the Land of Baden-Wurttemberg enacted protective measures against the spread of the COVID-19 virus. A vital

role was assigned to the police through large-scale surveillance measures and checks, with the aim of a visible police officer presence[2].

However, due to staff shortages, these planned measures could not be carried out effectively, particularly in small towns. The municipalities were therefore faced with challenges and hurdles in terms of public safety that were totally new to them. In accordance with the distancing measures promulgated, the municipalities had to uphold security and order, and to carry out checks where necessary—in the absence of police forces in most cases.

As in other towns, particularly in rural areas, Renchen was experiencing an increase in the number of young citizen gatherings. The solution was to mobilize employees of the local municipal services and the local volunteer fire department to carry out checks at regular intervals at certain key locations and to issue "warnings"[3]. This improvised measure had the desired effect: less gatherings took place.

3. Municipal Innovations and Crisis Resilience

The examples presented in the previous section illustrate the diversity of responses adopted at municipal level. In addition to the great heterogeneity of the areas concerned, five characteristics can be identified that are common to all or some of the solutions implemented:

- Situations that have not been previously considered and for which there are no predetermined solutions.
- Need for rapid response.
- Mobilization of unusual resources and/or recombination of existing resources.
- Original "do-it-yourself" solutions.
- Potentially temporary nature of the solution.

Each of these solutions corresponds de facto to a "novelty" for the municipality concerned. This raises the question of the nature of this novelty. In academic literature, the concept of municipal innovation is used. Moreover, as will be discussed below, acute crisis situations reinforce the imperative need for such innovation. Consequently, the ability to implement new solutions can be seen as a vector of municipal resilience.

3.1. The Concept of Municipal Innovation in the Literature

For decades, there has been a wealth of literature on the subject of innovation, both in economics and management science (see for example Pavitt, 1984; Metcalfe, 1998; Fagerberg, 2006). However, municipalities are not generally seen as initiators of innovation. More often than not, municipalities are seen as likely to adopt product or service innovations developed elsewhere.

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[2]Cf. Ministerium für Inneres, Digitalisierung Migration Baden-Württemberg (2021).

[3]Naturally, instructions were given to show tact and kindness towards the teenagers and young adults concerned. At the same time, according to a municipal decision-maker, these "impromptu patrols" were made up mainly of volunteers with… respect-inspiring bodies.

Consequently, little work is devoted to the very idea that "municipal teams"[4] can be innovators. Shearmur and Poirier (2017) were the first to attempt to conceptualize these aspects specifically. They see municipal innovations as non-market Schumpeterian innovation processes, and argue that municipalities are required to introduce product, process and service innovations in order to address the problems that result from a municipality's day-to-day service and management responsibilities[5]. In the environmental field alone, a wide range of examples of municipal innovations are presented, from biomethanization to environmental patrol to waterway management is detailed by Shearmur (2022). However, all the above examples only concern municipal innovations developed to improve or complement the services provided to residents in "normal" (i.e. non-emergency) situations. This raises the question of the place of municipal innovations in acute crisis situations such as the COVID-19 pandemic.

3.2. The COVID-19 Crisis as a "Game Changer"

In major crisis situations, it's not enough for public authorities to simply activate predefined emergency management plans. While such procedures do exist, they rarely cover all the difficulties involved. Moreover, depending on the degree of disruption wrought by the crisis, such plans may simply not exist: the emergency situation to be faced is so complex, the crisis so acute and the events so unpredictable that no plan could be devised (Ansell et al., 2021).

As a result, adhocracy in the sense of Mintzberg (1989) may prove insufficient[6]. Going beyond the bureaucratic stage may be a step forward in a disruptive crisis situation, but it doesn't necessarily provide all the solutions required. In addition, the development of satisfactory solutions may not be fast enough to deal with the crisis. Indeed, mobilizing and combining cross-functional expertise can be life-saving, but too slow. This explains the crucial character of "bricolages", i.e. imperfect but rapid solutions[7]. Clearly, unexpected resources have made it possible to cope—if only partially—with the severity of the crisis. The increased use of social networks is just one such example (Mano, 2020). These imperfect solutions correspond to what we might call innovations of necessity. At municipal level, the examples detailed in the first section show that:

Necessity makes it possible to immediately adopt—even if imperfectly—pre-existing technological solutions whose implementation was planned for the longer term and was held back by reluctance or the absence of the requisite human or financial resources.

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[4]Whatever the members of these teams, no distinction is made here between elected politicians and government employees, or even third parties (e.g. volunteers) mobilized in an emergency.

[5]"(…) *municipalities* (…) *introduce incremental product, process, and service innovations, which we call everyday innovations as they are in response to issues that arise out of municipalities' everyday service and management responsibilities*" (Shearmur & Poirier, 2017: p. 3).

[6]The term "adhocracy" is a neologism developed by Henry Mintzberg to designate a flexible, adaptable and informal form of organization, as opposed to the bureaucratic type.

[7]Here, the term "bricolage" is to be understood in the sense given to it by Claude Lévi-Strauss (1962), as opposed to the "scientific" solutions of the engineer.

- The solutions developed are usually cross-functional in nature. The usual circuits of decision-making and implementation are modified or even "shaken up". Compliance with explicit rules—including legal ones—takes second place, and habits (which form implicit rules) are ignored.
- While some solutions are only temporary, others are permanent, either because they were planned for the longer term, or because they have proved particularly effective, or because the crisis has made their adoption possible. In these cases, a "return to the past" is difficult, if not outright undesirable.

These three aspects contribute to overcoming the crisis and strengthening the resilience of municipalities.

3.3. Innovation as a Vector of Municipal Resilience

Resorting to innovations of necessity is a resilience factor for municipalities, in that these enable them to absorb large-scale disruptions and external shocks by reorganizing themselves while undergoing change, so as to endure and continue to perform the same functions.

To date, there is no definition of municipal resilience. However, numerous analyses have been carried out, focusing on the organizational resilience of companies or other complex systems[8]. For example, Folke et al. (2010: p. 6) consider that: "*In a nutshell, resilience thinking focuses on three aspects of social-ecological systems (SES): resilience as persistence, adaptability and transformability*".

More generally, Hillmann and Guenther (2021) propose what they call an integrated definition of organizational resilience resulting from a systematic review of the literature: "*Organizational resilience is the ability of an organization to maintain functions and recover fast from adversity by mobilizing and accessing the resources needed. An organization's resilient behaviour, resilience resources and resilience capabilities enable and determine organizational resilience. The result of an organization's response to adversity is growth and learning.*" (Hillmann & Guenther, 2021: p. 31).

This definition is perfectly suited to the analysis of municipal resilience. However, both theoretical work and empirical analysis on municipal resilience have yet to be developed.

4. Towards a Research Agenda

The previous two sections show that more in-depth analysis is needed. The various elements presented below constitute starting points for future research (theoretical and empirical) into the links between municipalities, innovation and resilience.

There are three main areas concerned:

- The establishment of municipal resilience as an organizational meta-capability.

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[8]See in particular Duchek (2020) and Hillmann and Guenther (2021) for detailed reviews of the literature on organizational resilience.

- The development of a typology combining municipal characteristics and robust strategies.
- The use of narratives making the link between resilience strategies and foresight analyses at municipal level.

4.1. Establishing Municipal Resilience as an Organizational Meta-Capability

In view of the above, it seems crucial for municipalities to go beyond the position of "receptacles" for crisis management procedures that are decided at "higher" administrative and state levels, and to be able to develop their own capacities to deal with extreme situations. It's not a question of going against decisions made elsewhere, but of complementing these decisions, or even making up for the absence of decisions.

Duchek's (2020) analyses emphasize the combinatorial nature of organizational resilience and consider it as a meta-capability: "(…) *we define organizational resilience as an organization's ability to anticipate potential threats, to cope effectively with adverse events, and to adapt to changing conditions.*" (Duchek, 2020: p. 220).

This general theoretical framework could be transposed to the scale of municipalities. Drawing on this work, three major axes of this municipal resilience meta-capacity could be explored in greater depth:

- The ability to anticipate. It's not a question of "guessing" what's going to happen (or what might happen), but of preparing reaction schemes that increase the effectiveness of interrelations between different players, which could prove crucial in the event of a crisis.
- The ability to withstand or absorb shock. This capacity is primarily based on the organizational ability to recognize the existence and gravity of extreme events, without resorting to denial or a wait-and-see attitude. The reaction time can prove decisive in the event of a crisis. Secondly, the ability to develop solutions by creatively mobilizing and recombining resources.
- Adaptability, which is based on the ability to manage a crisis over the long term, to facilitate the necessary adjustments, and even to integrate innovations developed out of necessity on a long-term basis.

4.2. Developing a Typology Combining Municipal Characteristics and Robust Strategies

Following on from their analyses of the impact of the pandemic on the public sector, Ansell et al. (2021) point to the need to develop what they refer to as "robust" strategies for public administrations in the face of crises. Such strategies are characterized in particular by the activation of networks including partners "external" to the public institution concerned. These partners may come from the private sector or civil society. Eckhard et al. (2021) draw on the concept they have developed, the mobilization of "latent hybrid resources" by public authorities. This involves finding solutions to extreme situations by integrating business

(increasing the flexibility of the response) and non-governmental organizations (increasing human or other resources on a voluntary basis) into public action. The two approaches converge very clearly in that they underline the need to go beyond the usual reactions and schemes, by integrating into the crisis response additional players whose raison d'être is normally independent of the public authorities.

In the specific case of municipalities, the development of robust strategies and the activation of latent hybrid resources are conditioned by a series of factors yet to be determined. In this respect, the establishment of a typology combining elements that characterize municipalities according to their constraints, the availability and types of resources that can potentially be mobilized, and the nature of the extreme events to be faced, could prove to be a particularly useful step in understanding and analyzing municipal capacities for innovation and resilience.

4.3. Using Narratives as Foresight Tools for Local Authorities in Order to Strengthen Their Resilience Capacities

As evoked previously the ability to anticipate potential threats is an essential dimension of the resilience capacity of an organization. Nevertheless, as depicted in section 3.2 local actors are rarely prepared to disruptive events. They mainly rely on the existence of predefined emergency management plans that were conceived "above them", mostly at regional or national levels. Sometimes these plans are not sufficient to face complex and acute situations. Sometimes, there is no plan at all. At the same time, municipal organizations have neither the human resources to develop such tools in-house nor the financial resources to engage expensive and sometimes unreliable consulting companies.

One possibility to enhance effectively the anticipation capacities of local actors such as municipalities in a more time and money effective way could the use of narratives. According to Hauptman and Steinmüller (2018: p. 50): "*It is commonly acknowledged that foresight needs imagination. But imagination is a broad field, including all forms of wishful or fearful daydreaming and of incoherent fantasies. (…) Paradoxically, we need stringent fantasies, methodologically controlled visions, reasoned irrationalities, counter-intuitive intuition.*"

The development of "science fiction oriented scenarios" may be very powerful in such situations. It should be investigated in how far different factors could make scenarios suitable in the context of municipalities and disruptive events. For instance, the following aspects could be considered

- The coherence of narratives resulting from the necessity of credible and logical pre-conditions.
- The introduction of disruptive events such as internal and/or external shocks (the so-called "wild cards")[9].

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[9]Although there is no unanimous definition of "wild cards" in the field of foresight, they can be understood as the apparition of extremely unlikely but extremely severe events like the "black swans" theorized by Taleb (2008).

- The possible gamification of the scenarios (inclusion of feedback loops enhancing the simulation dimension).
- An easier integration of participants with heterogeneous professional backgrounds (for instance technical vs. managerial) or socio-cultural characteristics (age, gender, etc.).
- A stronger adhesion of the participants through the "immersive effects" of narratives[10].

5. Conclusion

Local actors are rarely prepared for disruptive events. They mainly rely on the existence of predefined emergency management plans that were conceived at regional or national levels. Sometimes these plans are not sufficient to face complex and acute situations. Sometimes there is no plan at all.

The COVID-19 crisis was doubtlessly a time in which municipalities were confronted with so far unknown challenges but also a time they unearthed a great ability to innovate. This in turn is proof that local resilience is not only a state but also an ability that can be developed. In this respect, this paper provides some inroads for a better understanding of the links between municipal innovation and local resilience.

In this respect, some hints for future research should be considered. As a first hint, it should be stressed that the ability to anticipate is not a matter of "guessing" what will (or might) happen, but of preparing patterns of response. Such patterns of response make it possible to increase the efficiency of interactions between different actors that might prove decisive in the event of a crisis. The second hint is related to the ability to withstand or absorb a shock relies primarily on the organizational ability to acknowledge the existence and severity of extreme events without denial or a wait-and-see attitude. The speed of response can be critical in the event of a crisis. As a third hint, it must be emphasized that managing a crisis over a longer period of time means being able to permanently integrate (imperfect) innovations developed out of adversity.

Therefore, future researches devoted to the links between municipal innovation and resilience capacities should investigate in how far foresight activities could be relevant for municipalities. In this respect, two dimensions seem of utmost importance. The first dimension related to the factors which can reduce the complexity of foresight processes for municipal teams. The second dimension is linked to the first one and concerns the affordability of foresight exercises.

One limitation of the paper is that the analysis focuses only on one single town. The different innovations considered are to be taken as examples of multiple changes occurring during the crises. Nevertheless, this does not constitute an exhaustive analysis of what happened over the whole period concerned since

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[10]One hypothesis in this respect would be: "It is more fun being part or even the hero of a story than to read boring reports or listening to even more boring PowerPoint presentations".

further innovations were introduced.

Even if nobody knows which disruptive events will occur and when they will occur, at least one thing can be taken for granted: crises will occur and it is always better to aim to be prepared for the worse than to just hope for the best.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Ansell, C., Sørensen, E., & Torfing, J. (2021). The COVID-19 Pandemic as a Game Changer for Public Administration and Leadership? The Need for Robust Governance Responses to Turbulent Problems. *Public Management Review, 23,* 949-960. https://doi.org/10.1080/14719037.2020.1820272

Bundesministerium für Wirtschaft und Energie (2021). *Digitalisierung in Deutschland-Lehren aus der Corona-Krise. Gutachten des Wissenschaftlichen Beirats beim Bundesministerium für Wirtschaft und Energie (BMWi).* https://www.bmwi.de/Redaktion/DE/Publikationen/Ministerium/Veroeffentlichung-Wissenschaftlicher-Beirat/gutachten-digitalisierung-in-deutschland.pdf?__blob=publicationFile&v=4

Duchek, S. (2020). Organizational Resilience: A Capability-Based Conceptualization. *Business Research, 13,* 215-246. https://doi.org/10.1007/s40685-019-0085-7

Eckhard, S., Lenz, A., Seibel, W., Roth, F., & Fatke, M. (2021). Latent Hybridity in Administrative Crisis Management: The German Refugee Crisis of 2015/16. *Journal of Public Administration Research and Theory, 31,* 416-433. https://doi.org/10.1093/jopart/muaa039

Fagerberg, J. (2006). Innovation. A Guide to the Literature. In J. Fagerberg (Ed.), *Oxford Handbooks in Business and Management* (pp. 1-29). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199286805.003.0001

Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience Thinking: Integrating Resilience, Adaptability and Transformability. *Ecology and Society, 15,* 20. https://doi.org/10.5751/ES-03610-150420

Gewerkschaft Erziehung und Wissenschaft (2021, juin 1). *Digitalisierung im Schulsystem Herausforderung für Arbeitszeit und Arbeitsbelastung von Lehrkräften. Pressekonferenz zur Vorstellung der Studienergebnisse.* Kooperationsstelle Georg-August-Universität Göttingen. https://www.gew.de/index.php?eID=dumpFile&t=f&f=107283&token=db545dd6770223540e793d8dfa2b782c892b4aad&sdownload=&n=20210604-Digitalisierungsstudie-Kommentierte-Praesentation.pdf

Hauptman, A., & Steinmüller, K. (2018). Surprising Scenarios. Imagination as a Dimension of Foresight. In R. Peperhove, K. Steinmüller, & H. L. Dienel (Eds.), *Envisioning Uncertain Futures* (pp. 49-68). Springer. https://doi.org/10.1007/978-3-658-25074-4_4

Hillmann, J., & Guenther, E. (2021). Organizational Resilience: A Valuable Construct for Management Research? *International Journal of Management Reviews, 23,* 7-44. https://doi.org/10.1111/ijmr.12239

Kommunal (2022). *Recht Aktuell: Digitale Ratssitzung und Livestream.* https://kommunal.de/livestream-gemeinderat-recht-aktuell

Mano, R. (2020). Social Media and Resilience in the COVID-19 Crisis. *Advances in Applied Sociology, 10,* 454-464. https://doi.org/10.4236/aasoci.2020.1011026

Metcalfe, J. S. (1998). *Evolutionary Economics and Creative Destruction.* Routledge. https://doi.org/10.4324/9780203275146

Ministerium für Inneres, Digitalisierung Migration Baden-Württemberg (2021). *Sicherheitsbericht 2020.* https://www.baden-wuerttemberg.de/fileadmin/redaktion/m-im/intern/dateien/publikationen/20210219_Sicherheitsbericht_Baden_Wuerttemberg_2020.pdf

Mintzberg, H. (1989). Mintzberg on Management. Inside Our Strange World of Organizations. *Organization Studies, 11,* 1-16.

Pavitt, K. (1984). Sectoral Patterns of Technical Change: Towards a Taxonomy and a Theory. *Research Policy, 13,* 343-373. https://doi.org/10.1016/0048-7333(84)90018-0

Shearmur, R. (2022). 3 Boroughs, Small Municipalities, and Sustainability: What Is Municipal Innovation and Can It Make a Difference? In H. L. Kong, & T. Monforte (Eds.), *Sustainability, Citizen Participation, and City Governance: Interdisciplinary Perspectives* (pp. 65-92). University of Toronto Press. https://doi.org/10.3138/9781487543006-004

Shearmur, R., & Poirier, V. (2017). Conceptualizing Nonmarket Municipal Entrepreneurship: Everyday Municipal Innovation and the Roles of Metropolitan Context, Internal Resources, and Learning. *Urban Affairs Review, 53,* 718-751. https://doi.org/10.1177/1078087416636482

Sixt, W., Notheis, K., Menzel, J., & Roth, E. (2019). *Der Gemeinderat in Baden-Württemberg (3., überarbeitete Auflage).* Kohlhammer Verlag. http://www.content-select.com/index.php?id=bib_view&ean=9783170361911 https://doi.org/10.17433/978-3-17-036191-1

Taleb, N. (2008). *The Black Swan. The Impact of the Highly Improbable.* Penguin.