INVESTMENT STRATEGY AND RESEARCH

RESEARCH BRIEF

SIMULATING THE ATTRACTIVENESS OF LOCATIONS

Scenario-driven location analytics with data intelligence

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PATRIZIA

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01 INTRODUCTION

THE DYNAMIC MORPHOLOGY OF CITIES

We live in a period of urbanization. It is predicted that by 2050, more than two-thirds of the world's population will live in urban areas (Ritchie, 2018) . This, of course, is accompanied by a change in the morphology of cities, and thus a constant dynamic in the availability of amenities. The current volatile environment, dominated by geopolitical tensions, pandemics and economic stress will limit or even accelerate the re-distribution or density of amenities. Whilst the importance of amenity availability has been proven to exert an impact on real estate, it is still unclear how the attractiveness of a location will change if both negative and positive external developments accelerate. In the context of real estate investments the following questions are in the centre of this PATRIZIA Research Brief:

- Can we ex ante predict the development amenities?
- How robust is an investment location in case of a negative amenity shock?
- Can we quantify an upside scenario in case of a positive amenity shock?
- What needs to be built for a low-scoring site to become a top location?

Given the current volatile circumstances, the following research brief is more relevant than ever. It addresses these specific questions and aims to integrate them into an already developed data intelligence toolset to further support the investment process: the so-called AMENITY MAGNET SENSITIVITY.

Hannah Ritchie and Max Roser (2018) - "Urbanization". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/urbanization'
Cajias et al. (2022): Location analysis and pricing of amenities. Portfolio construction in the era of data intelligence.

02 BACKGROUND

IDENTIFYING SOURCES OF SHOCKS

Explanations for negative dynamics in the development of a city are probably not necessary. To only mention one possible negative scenario, imagine when an entire region experiences an economic downturn, such as higher unemployment and thus lower purchasing power. This often has a negative impact on the availability of points of interests (POIs) such as cafés and restaurants. Once a dynamic like this is set in motion, many more will follow. Gladly, those kinds of dynamics don't always have to be negative.

As a good example for a positive development stands Project "Havelufer Quartier" in Berlin-Spandau, north-west of the city center. The former industrial area, built during World War II, is protected as a historic monument and is to be put to new use, with a focus on residential living.

Positive Scenario

Project Development Havelufer Quartier

- Berlin, Spandau
- 1'800 residential units
- Before: industrial wasteland

→ Growth potential

However, the entire area was previously an industrial wasteland and thus not exactly equipped with a variety of amenities. Yet, when evaluating an attractive residential location, an analysis of the amenities is part of the process at PATRIZIA. It was not surprising that the location did not initially perform well amenity-wise, especially when compared with all of Berlin. However, a large development project such as "Havelufer Quartier" is most likely accompanied by a positive influx of POIs, either through natural processes or the construction of in-house amenities. With prior knowledge of such developments a score that is still low today can still be viewed positively in the near future.

The next step in supporting the assessment of a location's attractiveness through amenities, is its quantification. With the Amenities Magnet algorithm, the development from 2017 until today can be determined. But in order to integrate the factors mentioned above, a further elaboration of the Amenity Magnet Report is necessary.

See: Patrizia SE (2021): PATRIZIA investiert in Wohnprojektentwicklung in Berlin | PATRIZIA SE

03 THE FORECASTING APPROACH

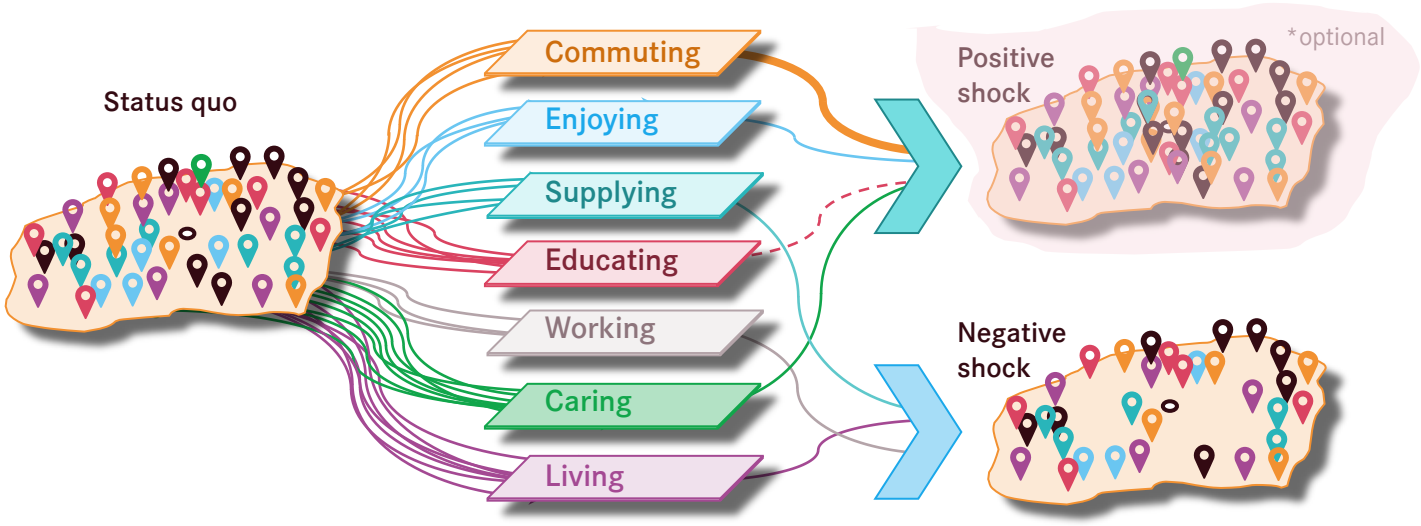
The Amenity Magnet Report has been mentioned several times now. It is a data intelligence tool helping in making investment decisions for real estate opportunities. The underlying assumption is that the availability of certain amenities is one important aspect in a location's attractiveness. The PATRIZIA Algorithm quantified this assumption by taking distance to and quality of different types of points of interest into account to calculate a score from 0 to 100: a *good* score would belong to the 75%-Quantile, a *bad* one is below that - compared to the rest of the benchmark. To meet the demands of various target groups, each asset class has its own underlying dictionary. The database contains groups with individual POIs, categorized according to their significance for the location. An extended toolset of the Amenities Magnet Report is the Amenities Magnet 15 Min, which categorizes POIs into groups of basic living needs. It is based on a scientific concept by Carlos Moreno, who argues that every location should have every basic living need within a reach of 15 Minutes walking or biking distance.

The figure below provides an overview of the methodological process:

- An Amenities Magnet Algorithm calculates a score for each of the seven basic-living-need groups. This results in seven location scores explaining the location's "15 minute readiness" within the benchmark.

- A **NEGATIVE SHOCK** is produced in the next step. It is assumed that there will be a decrease of 25 % of all amenities in the near future. The simulation takes place only in an area surrounding the target site to ensure that the site is directly affected. The output then points to groups which are more affected and to those who remain stable.

- A **POSITIVE SHOCK** is optional: it is only generated if the site isn't already in the upper 25%, only in a radius of 100 meters and only for an amenity which is missing from this category (lessons learned from backtesting, see next page). Suppose a site performs poorly in the "educating" group. In this case, a synthetic amenity - that is still missing in the overall benchmark, e.g. a kindergarten - would be placed in the immediate proximity of the site. Now the growth potentials in this group can be assessed.



Moreno et al. (2021): Introducing the "15-Minute City": Sustainability, Resilience and Place Identity in Future Post-Pandemic Cities.

04
BACKTESTING

Of course, we can't completely predict the future. In order to get meaningful results and back up the gut-feeling, we needed a way to validate our results. Since we are already able to look at real-world amenity trends, we decided to use them for backtesting. The starting point for AMENITIES MAGNET SENSITIVITY was POI data from 2017, where the outcome was still unknown. After calculating negative and positive shocks, the simulated values were compared to the "real" values from 2021. In the case of an actual negative development of the site, the simulated negative score quantiles highly matched the real ones with an average two points accuracy difference in the final score (Quantile Prediction = Quantile Actual ± 2, for a simulation size of 100). In other words, even though we cannot know if there will be a local increase or loss of amenities, we were able to predict the intensity of negative developments and therefore the robustness of a location. The AMENITY SENSITIVITY can therefore be used to estimate negative developments in the next 5 years.

05 INVESTMENT IMPLICATIONS FOR SELECTED LOCATIONS

But how can these results be used to support investment decisions? The standard **AMENITIES MAGNET REPORT** can be helpful in assessing the availability of amenities at a particular location without being on site, aiming at the following objectives:

- Understand the current living environment of each asset and how it changed over time
- Identify if there are any key selling points left for each asset
- Plotting competing assets in the amenity magnet reports and compare the scores
- For low performing assets, we can identify reasons for their low performances and find solutions on how to solve them

The **AMENITY SENSITIVITY** analyses are further extended to include the future perspective:

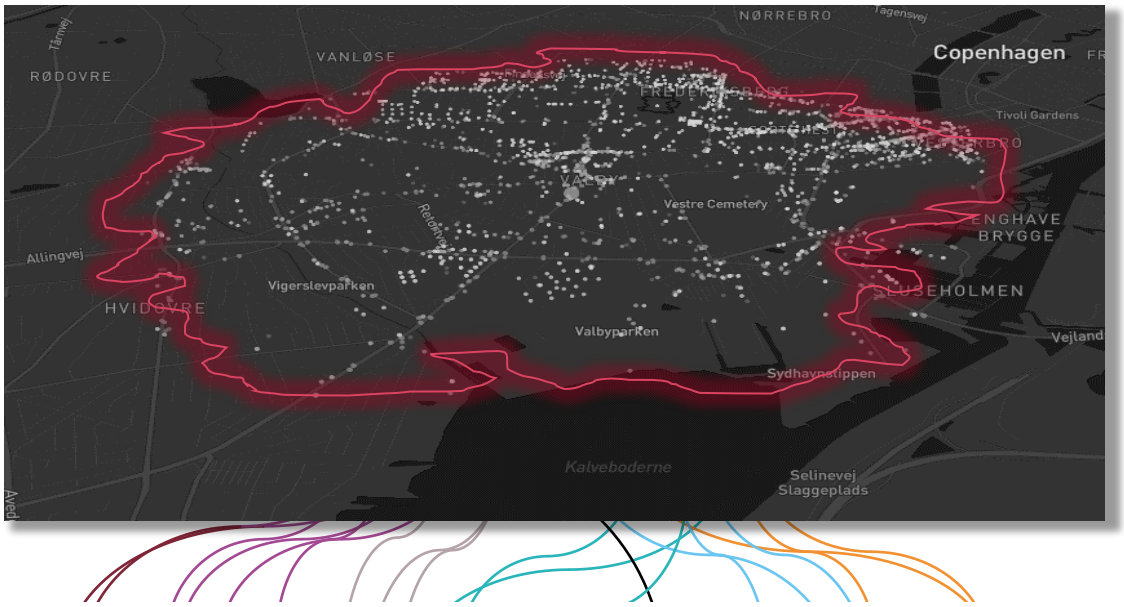
- How robust is a location in case of negative developments, i.e. loss of amenities in the surroundings?
- What amenity type needs to be built at the surroundings of a location to increase its attractiveness?

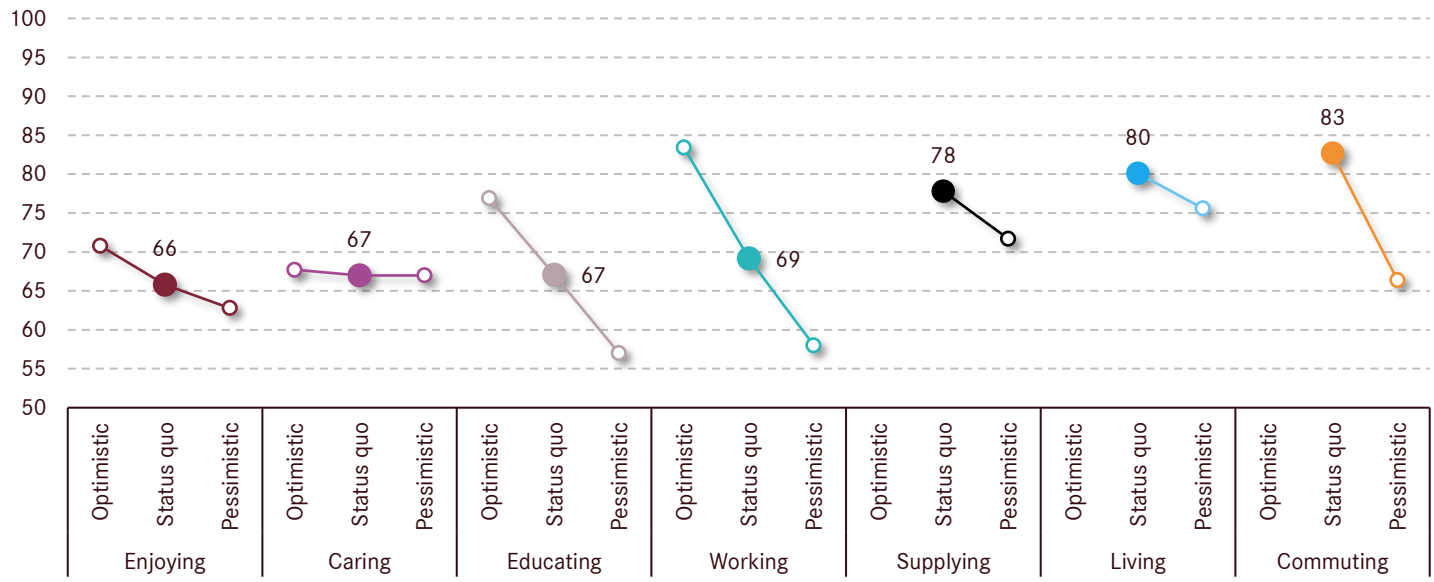
The best way to illustrate this is with the help of examples. After the backtesting, the AMENITIES MAGNET SENSITIVITY was applied to a portfolio of assets to estimate its future impacts. To demonstrate investment implications, the following three pages will take a closer look on the status quo and potential directions of amenity availability in Copenhagen, Berlin and Madrid. The asset in Copenhagen on the next page is situated south-west of the city center and does not yet belong to the upper quarter in many of the basic-living-need-groups, compared to its 15-Minute Benchmark. But what does that mean for future decisions, is there still room for improvement or is the site already doomed or saturated?

Cajias, Wins, Mokrane (2022): Location analysis and pricing of amenities. Portfolio construction in the era of data intelligence.

Amenity Sensitivity Analysis

Copenhagen, Gammel Køge Landevej





Assuming the creation of only one missing amenity in the "working" category, the asset shows great development potential by belonging to the upper quarter of working opportunities.

In a negative scenario the location decreases its position from the 69th percentile to the 58th.

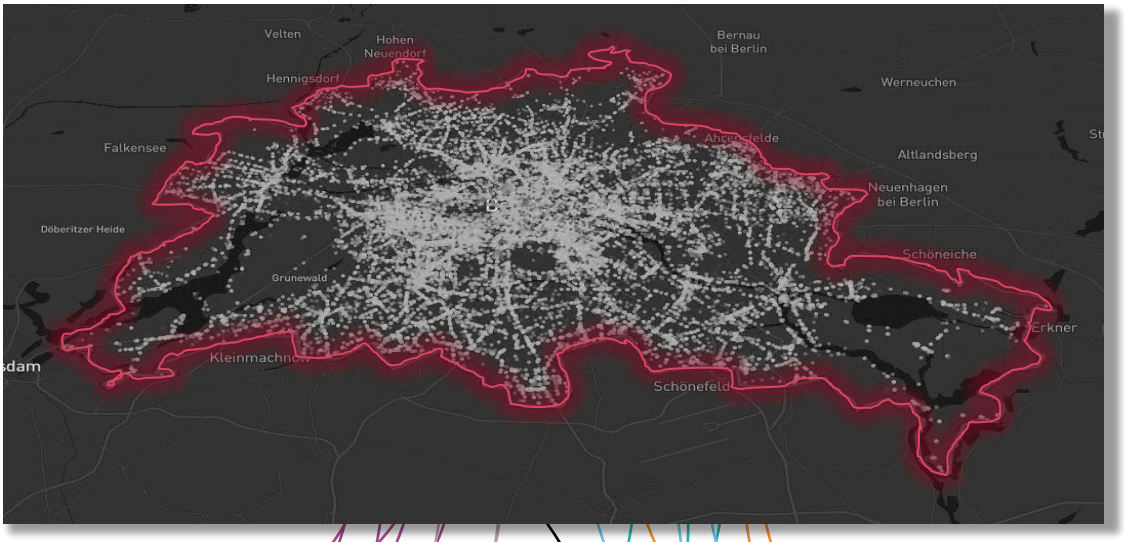
All in all, the results point to a high sensitivity in the working category.

The site has more commuting options than 75% of the remaining benchmark.

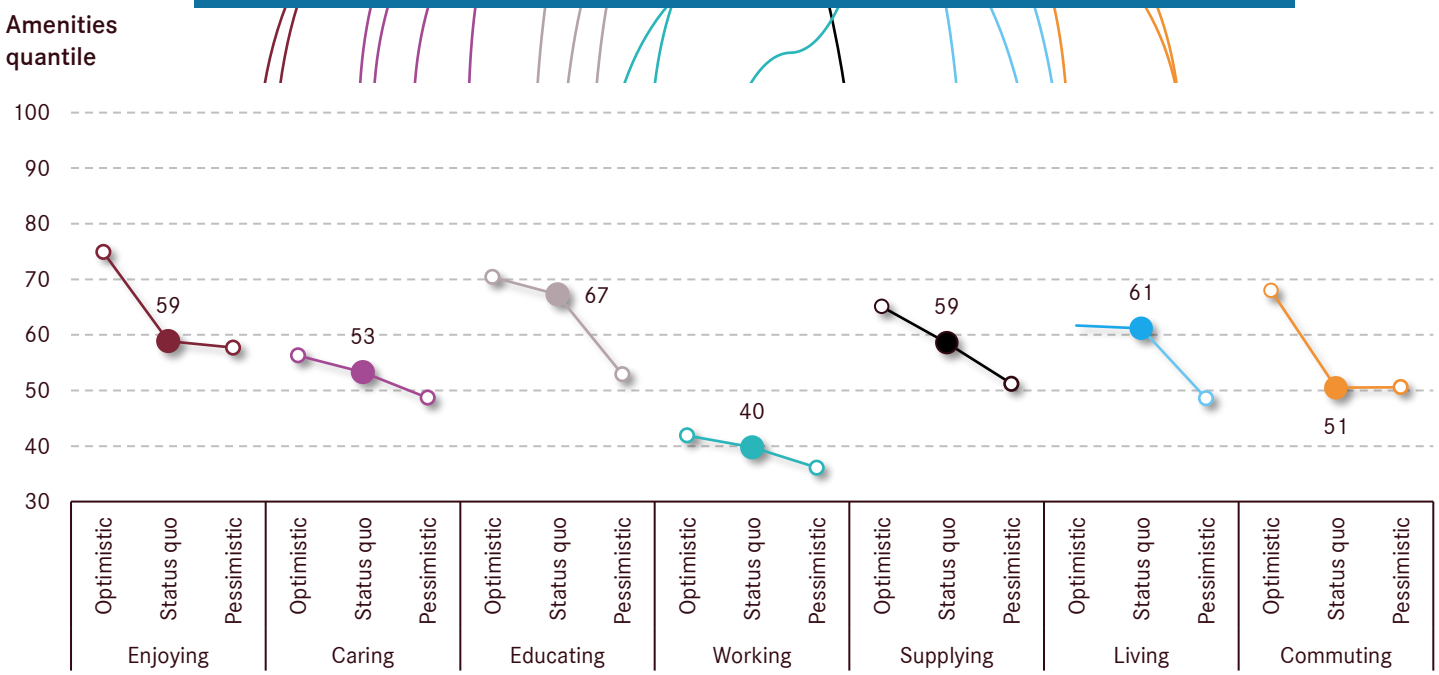
After a negative shock it would decrease its position by 16 ranking points, not reaching the 75%-benchmark anymore.

Amenity Sensitivity Analysis

Berlin, Streitstraße (“Havelufer Quartier”)



To demonstrate the development potential of the “Havelufer Quartier” project in contrast to the city as a whole, Berlin was taken as benchmark. Taking a closer look at the results above, it was to be expected that the location would not belong to the upper quantile in any group, as the competition with inner-city locations is simply too high.



Enjoying-amenities show the greatest potential (>75%-Quantile after positive shock)

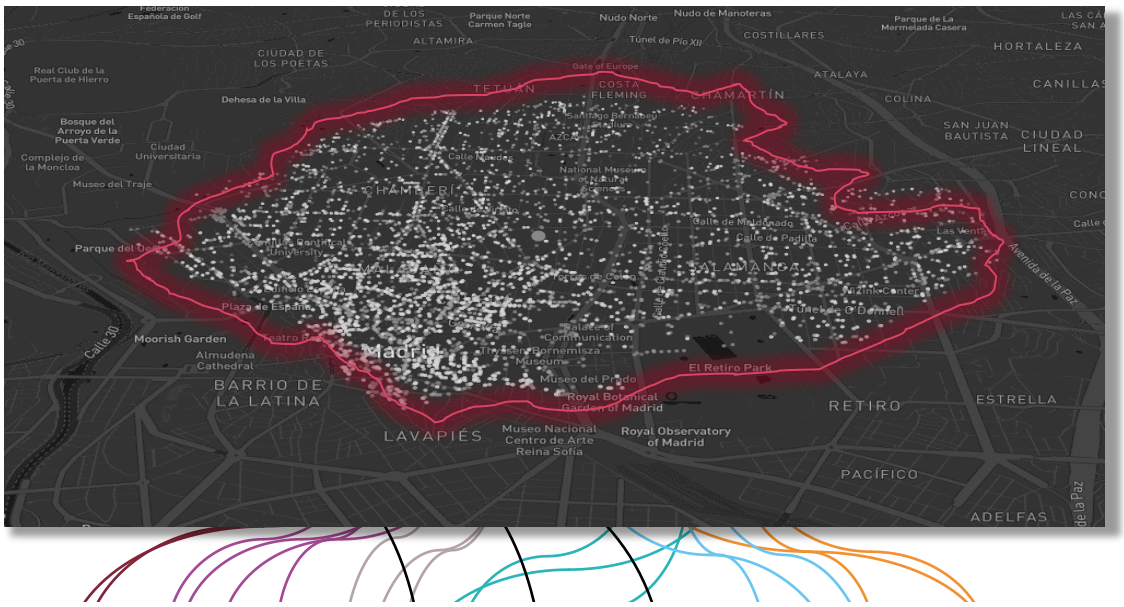
The location is almost as good supplied with educational amenities as the upper 30 % of the city

The location is undersupplied with *working*-related amenities.

The *“Commuting”* group would not be affected by a negative shock but has a growth potential of 18 ranking points.

Amenity Sensitivity Analysis

Madrid, Calle de Fernández de la Hoz



The location's amenity availability is rather robust, compared to the benchmark area

In a negative scenario the location would loose 20 points in the caring quality group

The quality of the location regarding working amenities remains solid, even in case of a negative shock

The downside risk regarding commuting amenities is very limited, pointing to a robust location

Needless to say, every site is different, and it's always worth taking a closer look. This tool can be used to gain interesting insights into a place even from a distance, especially discoveries that could be overlooked by the human eye. Whether as a selling or buying argument, for reporting or further marketing, there are basically two additional directions of analysis: which amenities are worth creating and which basic-living needs groups are particularly vulnerable.

Key takeaways

1. The PATRIZIA Data Intelligence tools around amenities measure location attractiveness taking points of interest into account and generate a score from 0 to 100.

2. Due to positive or negative influencing factors, the Amenities Sensitivity allows us to predict whether a site will remain solid or become unstable in a negative scenario.

3. After extensive backtesting with real examples the Amenities Sensitivity enables the identification of locations with signs of potential amenity growth.

4. Copenhagen Case Study:
Positive and negative shocks have similar impacts, with a high sensitivity in the “Working”-category, while “Commuting” has the greatest loss potential.

5. Berlin/“Havelufer Quartier” Case Study:
Compared to the whole city, the location does not belong to the upper quantile. It is undersupplied with “Working” related amenities whilst “Enjoying”-amenities show the greatest potential.

6. Madrid Case Study:
The locations amenity availability is rather robust, compared to the benchmark. “Caring”-amenities outperform the benchmark, whilst the “Working”-category is robust even in case of a negative shock.

➡ While we can't say which direction it will go, we can say how a location will react in future to different scenarios.

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