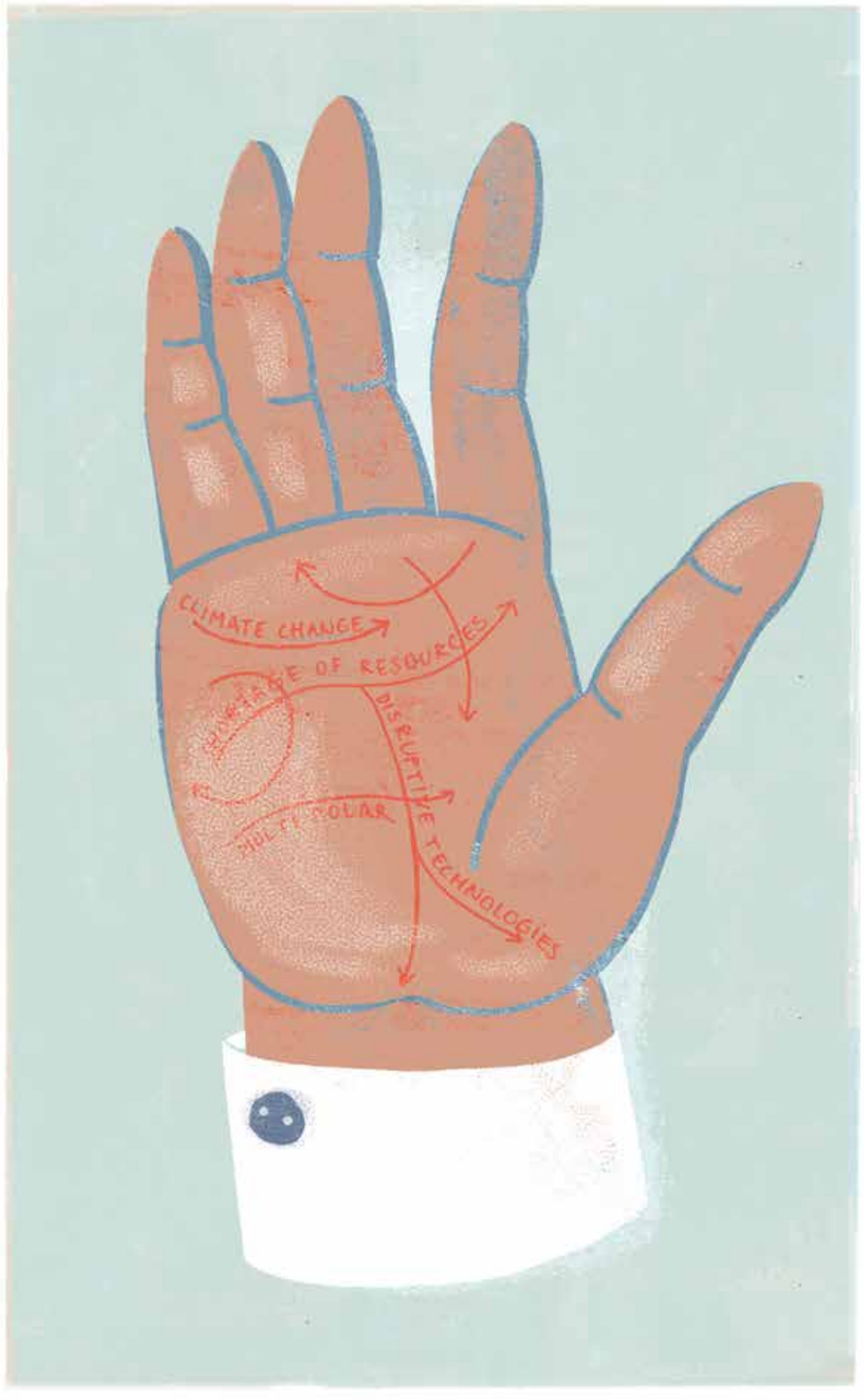

Illustration by Sylvia Neuner

The Trends in Megatrends

The most important megatrends and how to monitor them

Rick Eagar, Charles Boulton, Camille Demyttenaere

The forecasting of megatrends has significantly grown in recent years. Business, societies, governments and industries are increasingly demanding insights into future developments. At the same time, intelligence providers have come up with ever more sophisticated forecasting methods. In this article the authors shed light on the most important megatrends in the areas of technology, energy & the environment, economics & politics as well as social & health and examine how companies can best go about monitoring them.

The business of megatrend forecasting has grown significantly in recent years. As the clock speed of technological, societal and geopolitical change increases there is growing demand from companies and investors who need rapidly updated intelligence to better understand future opportunities, threats and potential disruptions at both global and local levels. At the same time, intelligence providers are developing ever more sophisticated methods to acquire, analyze and report trends as the "big data" revolution continues. Yet despite all this increasing sophistication, today the business world still seems to be frequently disrupted in ways that few had predicted, whether through technologies, business models, economics, politics (for example, the impact of the emergence of a new political order in the Middle East is still unfolding) or even natural events. With this in mind, in this article we take a brief look at the current "trends in megatrends": What megatrends are typically being highlighted at the moment by forecasters? And in the light of new and developing approaches to intelligence provision, how can companies best stay abreast of the latest megatrends in ways that are relevant for their businesses?

A review of megatrends

The term "megatrend" belongs to the lexicon of over-used business buzzwords, with the "mega" prefix intended to convey the idea of a trend which is very large scale compared to other trends. A useful general definition of a megatrend is "an inevitable evolution leading to a change of society, business, economics or environment." With this definition in mind – and therefore neglecting trends which are too domain-specific, industry-specific or detailed in nature, which would number into the hundreds – we recently

conducted a review of the general megatrends being highlighted by a selection of approximately 20 significant intelligence providers and trend observers. These were split across global management consulting firms (including Arthur D. Little itself), public organizations (such as the US National Intelligence Council, the European Economic Association) and four well-known market intelligence providers, all of whom have recently issued publicly-accessible megatrend reports.

Based on the review we have identified twelve commonly-cited megatrends across four dimensions as shown in Table 1 below:

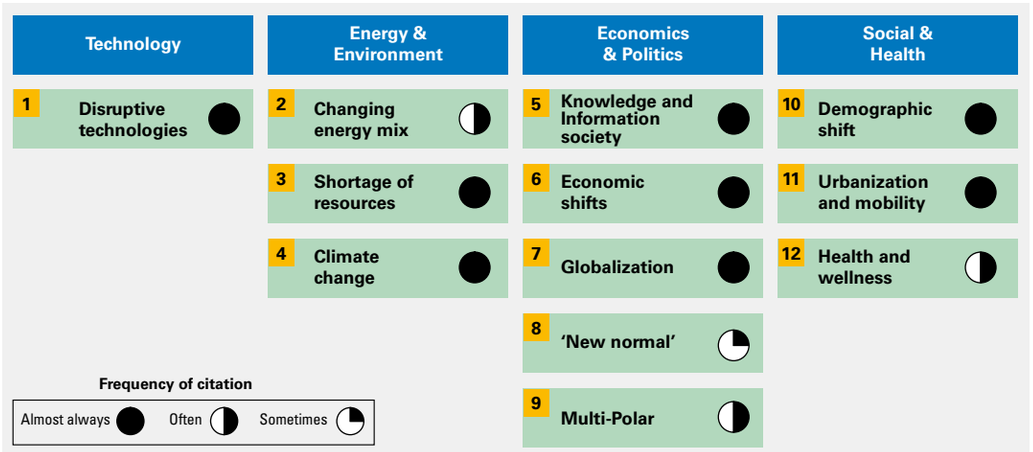

Table 1 **The 12 most discussed megatrends** *Source: Arthur D. Little*

Table 2 describes what each of these megatrends refers to, and provides some illustrative examples.

Dimension	#	Megatrend	Description	Examples
Technology	1	Disruptive technology developments	Major area, multiple technology megatrends cited by many different trend observers, e.g.: – Ubiquitous connectivity, Internet of Things – Materials (e.g. smart, nano, bio etc.) – Customization, personalization, localization – Data-driven technologies – Information security and data protection – Virtual world – Artificial intelligence and Robotics – Genomics – Personalized medicine – Etc.	• Global smartphone penetration exploded from 5% of the global population in 2009, to 22% by end 2013. By 2017, more than a third of all people around the globe will be smartphone users • The worldwide market for 'Internet of Things' is forecasted to hit $7.1 trillion by 2020, from $1.9 trillion in 2013
Energy and Envronment	2	Changing energy mix	New energy mixes to address growing demand, dwindling non-renewables, energy security, higher costs (e.g. shale, nuclear, coal, renewables etc.)	• China, the world's biggest energy consumer is projected to increase its energy demand by 75% between 2008 and 2035. Today it relies on coal for almost 70% of its total energy supply
	3	Shortage of resources	Shortages of water, food, rare earths, key commodities, including impact of environmental damage	• Approx1.2 billion people live in areas of physical water scarcity • 70% increase in food is needed by 2050 to meet population growth demand
	4	Climate change	Prevention, adaptation and mitigation to address climate change	• Greenland and Antarctica are losing 500 cubic kms of ice annually • Earth has warmed since 1880 with10 of the warmest years occurring in the past 12 years • By 2030, China's carbon dioxide emissions could equal the entire world's CO2 production today, if the country's carbon usage keeps pace with its economic growth
Economics and Politics	5	Knowledge and information society	Prevalence of knowledge as basis for economic value, ubiquitous information, growing personalized education, increasing automation requiring highly skilled workforces	• The United States will need to add 26 million workers to its talent pool by 2030 to sustain its average economic growth of the last twenty years • Western Europe will need 46 million additional employees
	6	Economic shifts	Economic power of emerging market economies overtaking developed markets, increasing middle class and growing wealth	• China's share of the world's total GDP is expected to grow from 7.1% in 2000 to 20.7% in 2020 • By 2030, the middle class is likely to comprise 4.9 billion people, of which 80% will live in what is now considered the developing world
	7	Globalization	Increasingly connected global economy and economic integration	• 77% of the FTSE top 100 UK companies' income is derived from outside the UK
	8	New normal	Lower interest rates, greater public policy interventions, greater public debt, bigger defense budgets	• The US public debt has risen from approximately 67.7% of national GDP in 2004 to 113.8% in 2014
	9	Multi-Polar	Diffusion of power, rising nationalism, shift to networks and coalitions in a multipolar world.	• Rising power of non-state actors and terrorist groups in the Middle East, North Africa, Asia
Social and Health	10	Demographic shift	Population growth, aging societies	• World's population has almost tripled in 60 years, projected to reach 9.6 billion by 2050
	11	Urbanization and mobility	Growth of mega-cities, smart-cities, need for investment in critical infrastructure for safe, fast, ecologically sound mobility	• World population in cities forecast to grow from 50% in 2010 to 70% in 2050 • The world will add approximately one new city of a million inhabitants every five days until 2050
	12	Health and wellness demands	Growing expectations for health and wellness, increasing risks of pandemics, burden of aging populations	• The proportion of the world's population over 60 years from 2000 will double from about 11% to 22%

Table 2 **The most commonly-cited megatrends** *Source: Arthur D. Little*

Most of these will be recognizable and familiar. Indeed, the high degree of consensus on megatrends at this level is one of the striking features. It is interesting to reflect on how much this consensus is simply a reflection of the available objective evidence, and how much it is affected by the tendency of observers to "flock" around issues already raised. It is to be expected that some flocking does take place, but in the end perceived realities can have just as much impact as objective realities in economic terms – with stock market dynamics being an obvious example.

One of the complications in understanding megatrends is that there are many important interconnections and overlaps – there is no one perfect taxonomy which avoids these. With this in mind, looking at combinations and intersections of megatrends is a very useful exercise for companies in order to understand impacts and opportunities that may be relevant for their value chain. For example:

- **Urbanization & Mobility + Demographics + Climate Change:** point towards the challenge of increasing exposure of transport hubs and supply chains to catastrophe, the need for greater resilience, and major opportunities for those who can develop solutions that provide robust fall-back and rapid recovery.

- **Health & Wellness + Demographics + Shortage of Resources:** point towards a massive potential health crisis in the coming decades, as well as, conversely, a potentially huge opportunity for the Healthcare sector to innovate in order to meet the challenge.

- **Disruptive Technologies + Other Megatrends:** point towards a myriad of potential opportunities through which new technologies could address the critical challenges facing the world in the coming decades.

There are many such combinations and intersections, and it is important to identify the ones that matter most to your organization. In other articles later in this issue we examine some of these intersections for particular domains, including Healthcare, Food, Energy, Operations Management and the Internet.

The changing face of megatrend intelligence

Being aware of global megatrends is one thing – developing strategies in response to them is quite another. All global businesses understand that they need an effective approach in place for gathering, analyzing and interpreting trend intelligence, and integrating it into strategy and planning. There is no shortage of data sources and the challenge for most companies is to transform this data into a form that is useful for business decision making.

Increasingly, companies are looking to external providers of intelligence and foresighting services to support these processes, and the business of intelligence provision is growing rapidly. For example, global spending on Big Data hardware, software and services is forecast to grow at some 30% p.a. over the next 3 years, with the Advanced and Predictive Analytics (APA) software market growing at around 10% p.a. (source: Forbes).

Providers of trend and megatrend intelligence and foresighting can be usefully mapped onto a simple intelligence value chain:

Process	Raw Data	Classification	Customization	Forecasting	Implication	Strategy and Tactics
Example	Economic/ demographic/ Big Data	Classification of data per country/ region/segment	Interpretation to suit specific value-chains/ industries/ markets	Intelligence, extrapolation, prediction	Interpretation for specific business	Strategic and tactical plans and actions
Provider	■ Governments ■ Statistics bureaux ■ Etc.	■ Governments ■ Statistics bureaux ■ Observers, experts, bloggers, social media ■ Data analytics providers ■ Trend/intelligence-forecasters	■ Market researchers ■ Networking/ conference providers ■ Consultancies ■ Corporate outlooks/ scenarios		■ Consultancies	
	■ Generic ■ Public ■ Free	**External**			**Internal**	■ Specific ■ Confidential ■ Expensive

Table 3 **Trend Intelligence Value Chain** *Source: Arthur D. Little*

There are differing service providers along the value chain between `Raw Data´ and `Strategy and Tactics´, with cost rising as specificity increases. As every researcher knows, today raw data is ubiquitous, and cheap, but of widely-varying quality; value is provided through transforming data into validated insight and intelligence. The approaches used by foresight and intelligence providers have consequently changed significantly in the last few years:

- **From static data gathering to dynamic reconnaissance:** Whilst in the past the core activity of intelligence gathering was to conduct periodic research and prepare analytical reports, this is now shifting towards setting up dynamic, agile systems that provide continuously-updated intelligence in targeted domains.

- **From specific analyses to whole system thinking:** Intelligence providers are increasingly able to set up search processes that enable 'whole system thinking' – taking better account of interconnections, cause-effect relationships, vicious/virtuous circles and macro-level effects – to be better reflected in intelligence gathering and subsequent interpretation. Examples include Visokio and Southbeach amongst many others.

- **Continuous scanning:** Instead of manual searches, many intelligence providers are able to set up automated or semi-automated systems to scan competitors, regulators, trends, observers and bloggers in a more intelligent way, for example using natural language processing, "triangulating" versus several data sources, and generating automatic report digests, all of which reduce the problem of "boiling the ocean" and coping with large volumes of irrelevant data. Shaping Tomorrow is one example of a provider of this type of service.

- **Use of models and simulations:** Some intelligence providers offer calibrated models and simulations to facilitate "what-if" exercises and underpin forecasting. Some models include collaborative role playing and forecasting games to leverage global expertise. Other models may involve mixing large and disparate datasets (e.g. GDP and happiness). Gapminder (www.gapminder.org/) is a good example of a not-for-profit organization that provides intelligence on global trends in this way.

- **New foresighting tools:** There are many new foresighting tools available on the Internet, many of which are freeware, aimed at leveraging the collective power of the web community (See Box)

- **Integrated intelligence service providers:** In addition to the major data analytics software companies such as SAP, IBM, SAS, Microsoft, Oracle, Information Builders, MicroStrategy, and Actuate, there is an increasing number of foresight intelligence service providers, both commercial and not-for-profit, for example Shaping Tomorrow, Institute for the Future, Innovation Watch, Global Future and Foresight, Forum for the Future, World Future Society, and many others.

A selection of foresighting tools

- **Parmenides Eidos:** Visual strategic options analysis tool allowing visualization of relationships and outcomes.
- **Real-Time Delphi:** On-line questionnaire for collecting and synthesizing expert opinions to support global opinion studies.
- **SciCast:** Crowdsourced prediction tool to forecast the outcomes of key issues in science and technology.
- **Analysis of Competing Hypotheses:** Software to analyze incomplete or ambiguous information.
- **Insights Maker:** Online shared simulation and modeling tool which uses causal loop diagrams or rich pictures to describe a system.
- **Implications Wheel:** Software-enhanced group process for discovering and mapping the implications of change (e.g. emerging trends, M&A, new policies, new regulation, etc.).
- **Coggle:** Freeware mind-mapping web application which produces notes online which can be shared and edited by several people at the same time.
- **Kumu:** Cloud-based visualization platform for mapping systems and better understanding of relationships.

Source: Shapingtomorrow.com, Arthur D. Little

Implications for business

Business intelligence and analytics are already well-established functions in most large companies, especially those in the faster-moving B2C sectors such as consumer goods, creative industries, telecoms and fashion. However in the B2B world, business intelligence is often much less sophisticated, with approaches based on more traditional market-analysis using published reports supplemented by specific surveys and insight studies. Megatrend analysis in particular is often considered as a secondary or occasional activity. With this in mind we highlight below three key lessons for companies to improve their megatrend intelligence efforts:

1. Run a true end-to-end intelligence process

One of the main challenges companies often face is how to effectively integrate macro-level intelligence into strategic and tactical planning processes. Whilst this may be clearer at the more detailed functional level (for example, most companies have well-defined processes for managing critical activities such as customer insight, technology intelligence and/or market intelligence), it may be less clear who monitors megatrends and what happens with updated trend intelligence. Good practice is to define an end-to-end process that recognizes the various stages of the intelligence value chain.

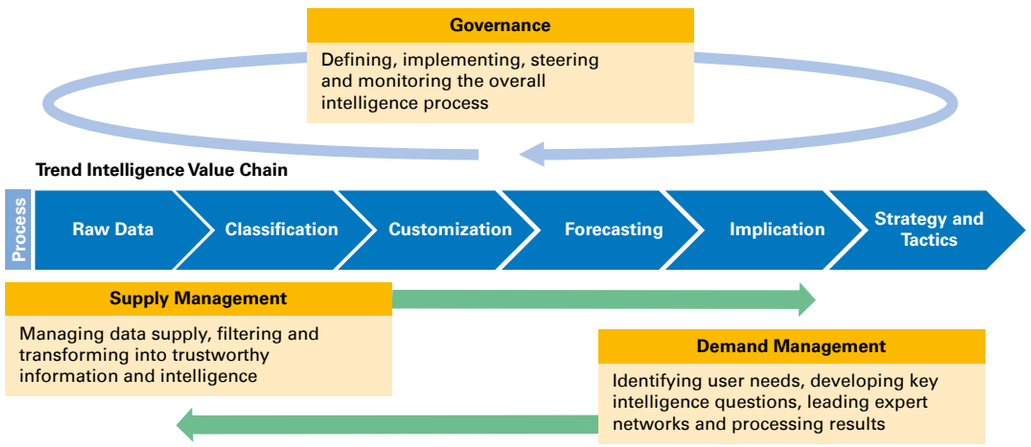

Table 4 **From the raw data to strategy and tactics** *Source: Arthur D. Little*

Key success factors in this respect include:

- Establishing governance that oversees the process, including priorities, methods, approaches, training and performance/impact. A key role is to ensure wide internal engagement with the process and maintain close alignment with business strategy.

- Defining an "Intelligence Demand" role, if necessary duplicated across different parts of the business, that focuses on identifying user needs, developing key intelligence questions, leading expert networks and processing intelligence results – helping to ensure integration within the business.

- Defining an "Intelligence Supply" role that filters and transforms external data into information, knowledge and insight – including managing external intelligence provision, and building up the profile of the company as a "hotspot" to attract intelligence.

GE is a good example of a company that runs a structured end-to-end process that systematically searches for new trends in the broader business environment, distinguishing between the long-term (3-6+years) and the short- to medium-term (0-3 years), with tailored approaches and methods for each.

2. Choose the right providers for each part of the process

As we have seen above, choosing the right providers is today more complex than ever. Good practice is to use a variety of providers covering different parts of the value chain. As long as there is adequate internal resource for research and analysis, there is a vast amount of free (or very cheap) raw data available. With regard to Classification/Customization/Forecasting/Implications, there are many new/recent providers who offer a range of services as well as conventional research and analysis. These include:

- Continuous idea/issue scanning and alerting
- Trend/pattern identification and profiling
- Foresighting
- Network management and development
- Modeling and simulation

A key factor for success in interacting with intelligence networks is to become a true part of the forecasting community – this means being a giver as well as a receiver of intelligence. Those that only take without giving will fail to attract the interactions they need, and will eventually lose out.

Needless to say, at the downstream stages of the process where intelligence interfaces with strategic planning, internal resources or trusted consulting advisers are often most appropriate. In many ways this is the most critical part of the activity because it is here that the situation is framed, the questions articulated and sense is made of the emerging messages. It is vital that weak signals be detected, while at the same time there is a robust output that is stable enough to allow formal strategies to be developed. Managing this is as much about organizational processes and politics as it is about data and intelligence.

3. Experiment with emerging approaches

As we have seen, tools and approaches are evolving fast and there is merit in experimenting with the many emerging tools mentioned above, especially dynamic reconnaissance, modeling and simulation, and network management. The key is to retain the stability of the current prevailing narrative that underpins strategy, while exploring the potential for new approaches through well-defined exploratory projects. Then the key questions are whether the new approaches offer new insights, identify new opportunities or threats, and whether and how the new approaches can be integrated into established systems of sense-making and strategy. In general, the new approaches should augment rather than overturn the old, especially for companies that have already built robust mechanisms for supporting and updating strategy from intelligence processes. Adding to your knowledge needs to become a regular habit, not just a series of one-off initiatives.

In conclusion

The rapid changes in the potential availability, quality and currency of trend intelligence as outlined above are providing new opportunities for companies to significantly improve their business intelligence approaches – something which is recognized as being increasingly essential in the current era of hyper-competition, technology disruption and increased customer power (see also Prism 2/2013 "The Creativity Era"). Will this help the world to anticipate major global events and disruptions better than we have done in the past? The jury is probably still out on this. But for companies operating in an increasingly disruptive world, surely it makes sense to do the best we possibly can.

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