
The Global Drone Industry Barometer 2023

DRONE
INDUSTRY INSIGHTS

Consolidating New Trends and Perspectives of the Commercial Drone Industry

Drone Industry Insights | Whitepaper | August 2023



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EXECUTIVE SUMMARY

We are delighted to present the findings of our comprehensive global drone industry survey, which has garnered significant recognition and participation from industry experts worldwide. With an impressive 1,113 survey responses received from 85 countries, this free white paper provides unique insights into the current state of the drone market, encompassing market segments, industry analysis, application methods, and the challenges and priorities faced by businesses.

Market Segments: Smaller Companies Dominate, Yet Larger Companies on the Rise

The drone market continues to be driven by a multitude of innovative companies, with a notable representation from smaller enterprises. However, we have also received over 45 responses from companies with more than 5,000 employees, indicating a growing recognition of the immense potential of drone technology among larger organizations. Our analysis delves into the hardware, software, and service segments, which are propelling progress in the commercial drone market.

Industry Analysis: Mapping and Surveying Dominates, Inspection Method Gains Traction

Our survey reveals that mapping and surveying have emerged as the dominant methods among drone applications, capturing a significant market share of 37% among business internal services (BIS) companies and 33% among drone service providers (DSPs). This underscores the precision and efficiency of drones in capturing geospatial data, benefiting industries such as construction, mining, and agriculture. Photography and

filming secure the second position for both types of companies, contributing to 31% of BIS activities and 27% of DSP engagements. Notably, DSPs exhibit a higher utilization of the inspection method compared to BIS companies in various industries, with inspections accounting for a 25% share among DSPs and a 16% share among BIS firms.


Expectations and Reality: Optimism Prevails

Our survey participants express a strong sense of optimism for the future of the drone market, with expectations for 2023 rated at 6.6, surpassing the global average of 6.3 in 2022. Interestingly, the pandemic-induced high expectations of the previous year have given way to a more realistic outlook. However, the new high expectations for 2023 reflect a balanced perspective on the industry's potential for growth and innovation.

Challenges and Priorities: Regulatory Obstacles Remain the Biggest Challenge

Regulatory obstacles continue to pose significant challenges for the drone industry, with rule-making authorities identified as the top market-driving factor. Our survey provides valuable insights into the challenges and priorities faced by businesses in the drone market. Marketing and sales emerge as the leading priority for the next 12 months, reflecting a shift towards promoting and selling refined products and services.

In short, this year's survey reached even more corners of the globe thanks to several strategic partners, and we can't wait to see what we all achieve and learn together next year.



The most represented survey respondents come from Japan, the US and China.

INTRODUCTORY FACTS OF THE DRONE INDUSTRY BAROMETER

The 6th annual drone industry survey took place in May and June of 2023. Over the course of eight weeks, we collected a record **1,113 survey responses**, which represents a 25% increase compared to the 891 responses collected in 2022.

Respondents came from **85 countries** (2022: 81 countries), with the leading countries being Japan (228 responses), the United States (157), and China (81).

Overall, the top 10 most-represented countries account for 65% of responses (2022: 71%), showing a **greater influence across the globe** and beyond the top markets.

The survey was distributed via the Drone Industry Insights newsletter and social media accounts as well as by **supporting partners** and their distribution channels. A comprehensive list of these partners can be found at the end of the report.

Top 10 Most-Represented Countries

- 1  Japan
- 2  United States
- 3  China
- 4  Spain
- 5  Germany
- 6  Italy
- 7  India
- 8  United Kingdom
- 9  South Korea
- 10  Malaysia

Countries Represented in the Survey

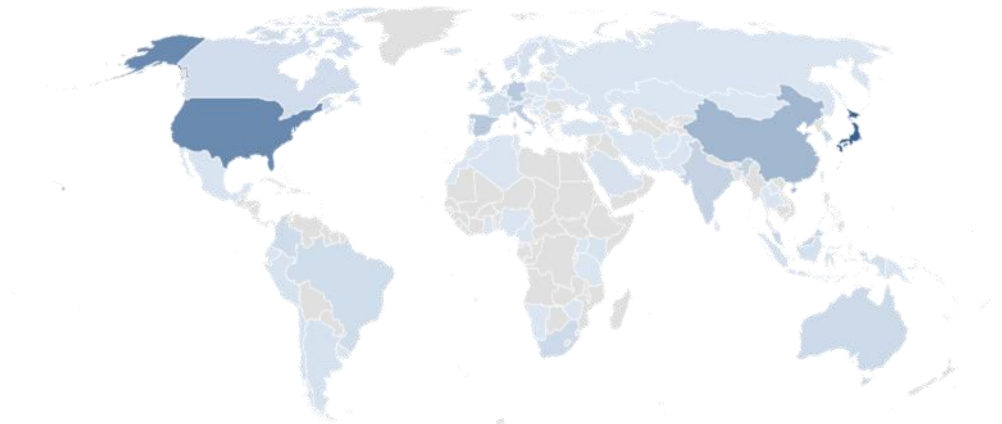


Fig 1: Most Represented Countries in Drone Industry Barometer Survey 2023

Survey Respondents By Market Segment

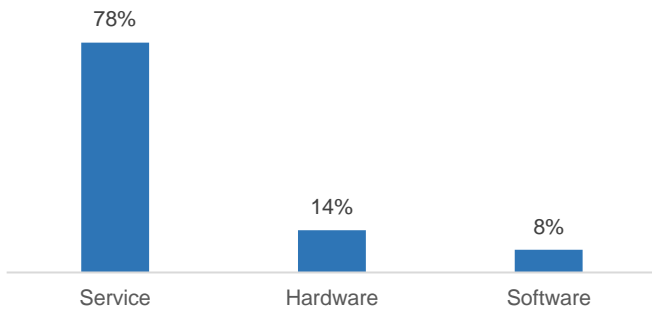


Fig 2: Survey Respondents by Market Segment (n=1113)

The response share from the **service sector** dipped slightly from 2022 (83%). Drone service providers (DSPs) represent 30% of participants within this sector (not pictured in graph). Meanwhile **hardware** manufacturers increased to 14% from 10% in 2022. This is likely influenced by greater participation from Chinese companies, which was a similar case in the 2021 edition of this survey. **Software's** share also edged up compared to last year (2022: 7%).

Survey Respondents By Company Size

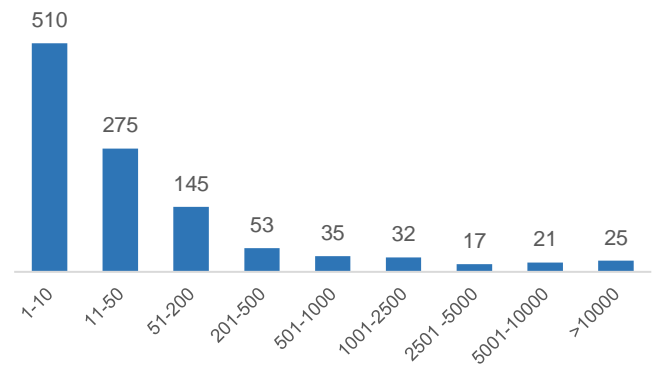


Fig 3: Company Size of Respondents (n=1113)

Regarding company size, **most respondents (46%)** were small companies of less than 10 employees, followed by those with 11 to 50 employees (25%). This emphasizes startups and SMEs as key drivers of the drone industry. Nevertheless, there are also 46 responses from companies of **more than 5,000 employees**, which shows that there are still plenty of large companies in the commercial drone landscape.



The Mapping & Surveying is the most applied method of both DSPs and BIS companies.

DRONE OPERATION

What exactly do drone companies do and in which industries do they operate? All the featured companies are either Drone Service Providers (DSPs) or Business-Internal Services (BIS). DSPs provide drone services to external actors in diverse industries (e.g. energy, construction, agriculture). Conversely, BIS companies utilize drones for internal operations and do not provide services to external clients.

The most significant discoveries from the survey include:

- This year, **Mapping & Surveying** emerges as the dominant method among [drone applications](#), constituting a 37% share among BIS companies and 33% among DSPs.
- **Photography & Filming** secures the second position for both types of companies, contributing to 31% of BIS

activities and 27% of DSP engagements.

- An intriguing contrast is the higher utilization of the **Inspection** method by DSPs compared to BIS companies in various industries. Inspections claim a 25% share among DSPs and a 16% share among BIS firms.
- The **remaining methods** - Localization & Tracking, Delivery, and Spraying & Dispensing - each represent shares ranging between 3% and 5% for both DSPs and BIS entities.
- While Photography & Filming held the top spot last year, the focus has shifted this year toward Mapping & Surveying, which suggests a growing inclination among drone operators to undertake **more specialized and professional tasks**.

What is the main applied method within industry?

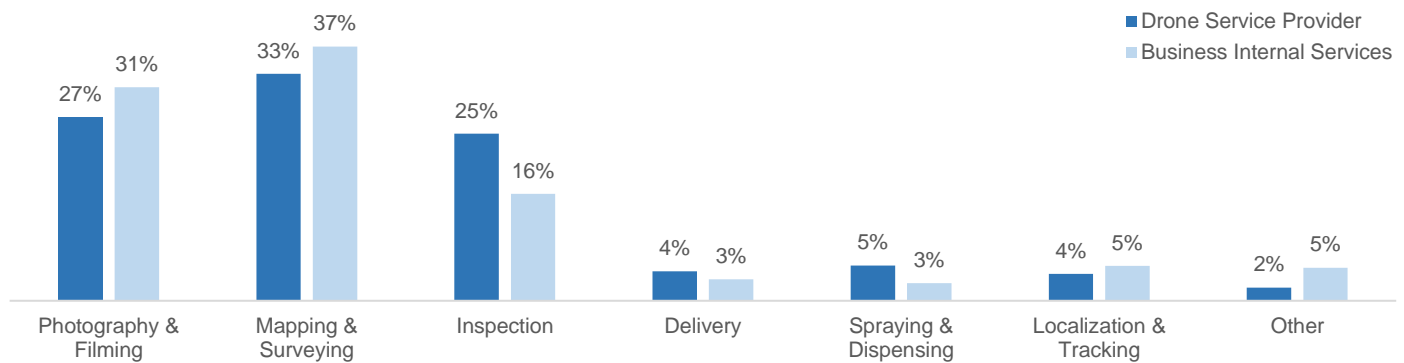


Fig 4: Main Applied methods (multiple answers possible, DSP:329; BIS:77)

What were your main reasons for adopting drones?

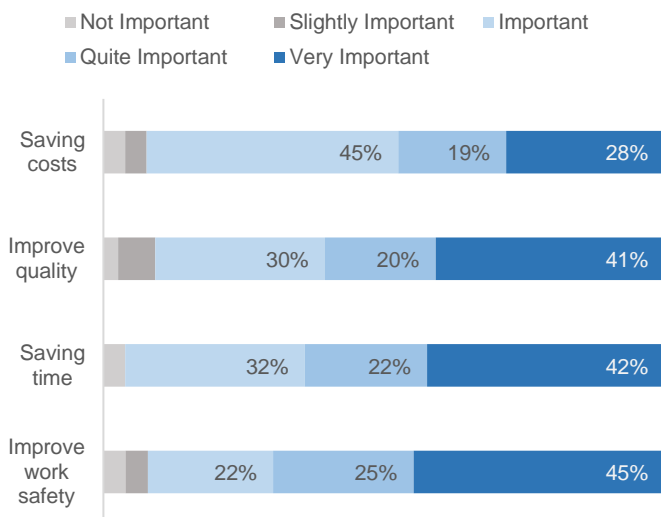


Fig 5: Reasons for Adopting Drones (n=78)

So, why use drones? On a 1-5 scale from *not important* to *very important*, the survey asked BIS operators about the 4 core reasons to adopt drone technology.

When looking at what the industry considers “very important”, the top reasons to adopt drones are [in order]: improving work safety (45%), saving time (42%), and improving quality (41%). However, adding a bit more nuance and taking “quite important” and “important” into consideration, provides a different insight. **One could argue** that saving time is the overall top reason since almost all operators (96%) consider this factor important, quite important or very important.

Conversely, when looking at a combination of the response rate for “not important” and “slightly important”, it would seem that improving quality is the least important factor. **And yet** this simplification would negate the fact that more respondents considered this aspect “very important” than those who considered saving costs as very important.

In the end, all of these top reasons have their merits and the reader is encouraged to make decisions based on the **nuance in the data** rather than simpler figures.



Drone companies' expectations and actual realized revenue converged again in 2022. In general, companies are very optimistic for growth in 2023.

EXPECTATIONS VS. REALITY

The Barometer survey functions as a compass, tracking companies' projections for the ever-shifting drone market. Visualized in the graph below is the **interplay between foresight and hindsight** (ex ante versus ex post) over the past years. The rhythm of market development aligns with companies' sales growth. Across the span of the last five survey years, a discernible trend emerges: a gradual easing of industry expectations (illustrated by the blue bubbles), with a noteworthy exception in 2021, when optimism surged markedly after the pandemic. This year's survey results sustain the momentum, suggesting a modest uptick in industry expectations.

Directing our attention toward the coming year, a narrative of

alternating optimism and realism emerges. In 2018, respondents expressed buoyant optimism, registering a score of 7.3. The subsequent years, 2019 and 2020, witnessed a tempered outlook, recording 6.6 and 6.3, respectively. In 2021, optimism made a comeback, scoring 7.2 as respondents anticipated robust growth ahead. However, this soaring optimism experienced a dip in 2022, settling at 6.3. The most recent chapter, 2023, reflects a **resurgence of positivity**, raising respondents' expectations to a level of 6.6.

These insights weave together a tapestry that portrays the evolving dynamics within the drone industry—a narrative marked by alternating waves of **anticipation and realism**.

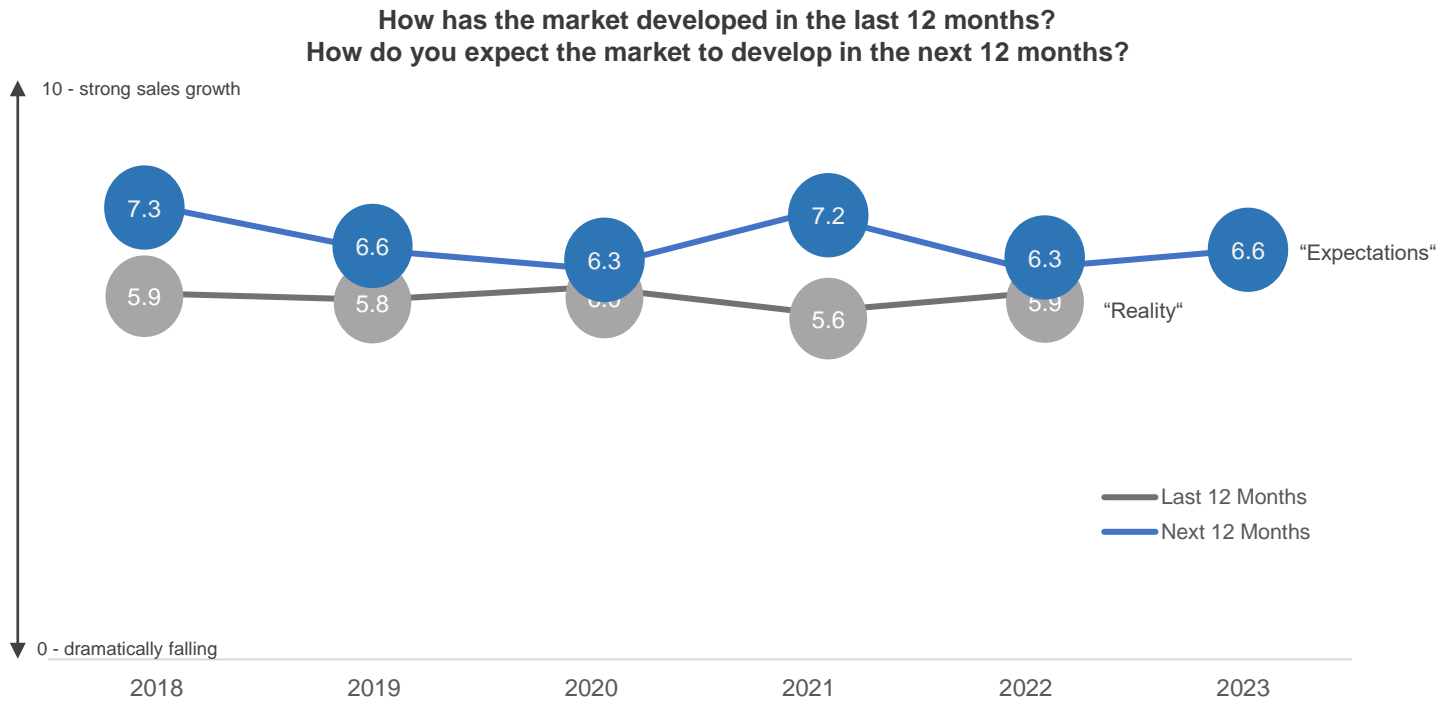


Fig. 6: Market Development in the next 12 Months and Their Reflections on the Past 12 Months (n=1011)

The chart above offers a visual insight, using grey bubbles to depict how respondents evaluated their experiences over the previous 12 months. A slight uptick from 5.6 in 2021 to 5.9 in 2022 indicates a **better market performance** compared to the year before.

Between 2018 and 2020, a trend emerged where expectations and reality appeared to come closer together. However, the narrative shifted in 2021, as the gap between anticipation and actual outcome widened significantly. While it's common for expectations to exceed reality, the particularly high hopes in 2021 might have led to a less positive retrospective view of the year.

As we move into 2022, there seems to be a return to a more balanced alignment between expectations and reality. The difference between the two is very much like in 2020, and once again the expectations for the following year are higher though nowhere near as overly-optimistic for 2023 as they were for 2021.

MARKET DEVELOPMENTS BREAKDOWN

Across numerous market segments, companies experienced a moderate level of market development in the past 12 months (indicated by the **gray line**) than in the previous year. The overall anticipation for the drone market in the forthcoming year rose slightly, shifting from an average score of 6.3 in 2022 to 6.6 in 2023. This upward trajectory is echoed within individual market segments (as indicated by the **blue line**).

Within **hardware**, perhaps the most striking observation is that **counter-drone** manufacturers. Their score rose from 7.0 in 2021 to an impressive 8.3 in 2022 and created an expectation of 8.8 for 2023. **Drone components and systems manufacturers** on the other hand have experienced a decline in performance since 2021 despite rising expectations, which is perhaps why their expectation for 2023 is at an all-time low (6.6). **Passenger drone manufacturers** faced a less favorable year in 2021 (score of 5.0), yet they rebounded in 2022 with a score of 6.3 and they carry a high expectation of 7.0 for 2023.

In the **service sector**, a consistent pattern emerges across all

sub-segments. In 2021, expectations were notably upbeat about the market, followed by a substantial decrease in 2022, and a minor resurgence in 2023. **Drone integration and engineering** companies have the highest expectations for 2023 (7.3) while **drone training and education** companies have experienced the steadiest improvement despite wavering expectations. **Drone operators for business-internal services (BIS)** have done the opposite. **Drone Service Providers (DSPs)** displayed robust growth, elevating their score from 5.6 to 5.9.

Software manufacturers find themselves in a relatively steady position, as their expectations have remained largely unchanged over the past three years.

Building upon the observations made earlier (as shown in Figure 6 on the previous page), the pandemic year **2021 stands out** for having the widest gap between overall expectations and reality. This discrepancy is similarly apparent in sub-segments, particularly within the service segment.

**How has the market developed in the last 12 months?
How do you expect the market to develop in the next 12 months?**
(0: dramatically falling - 10: strong sales growth)

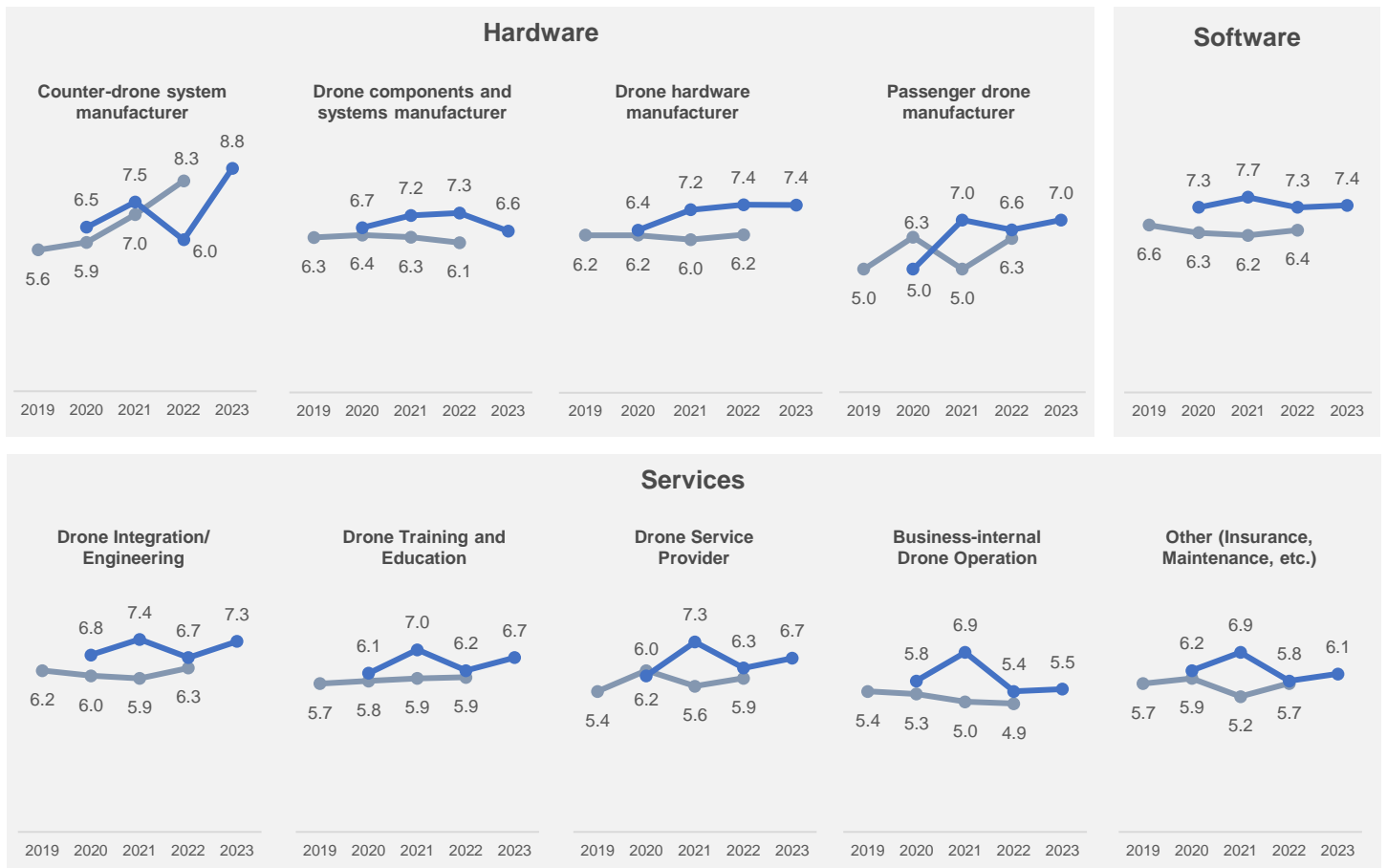
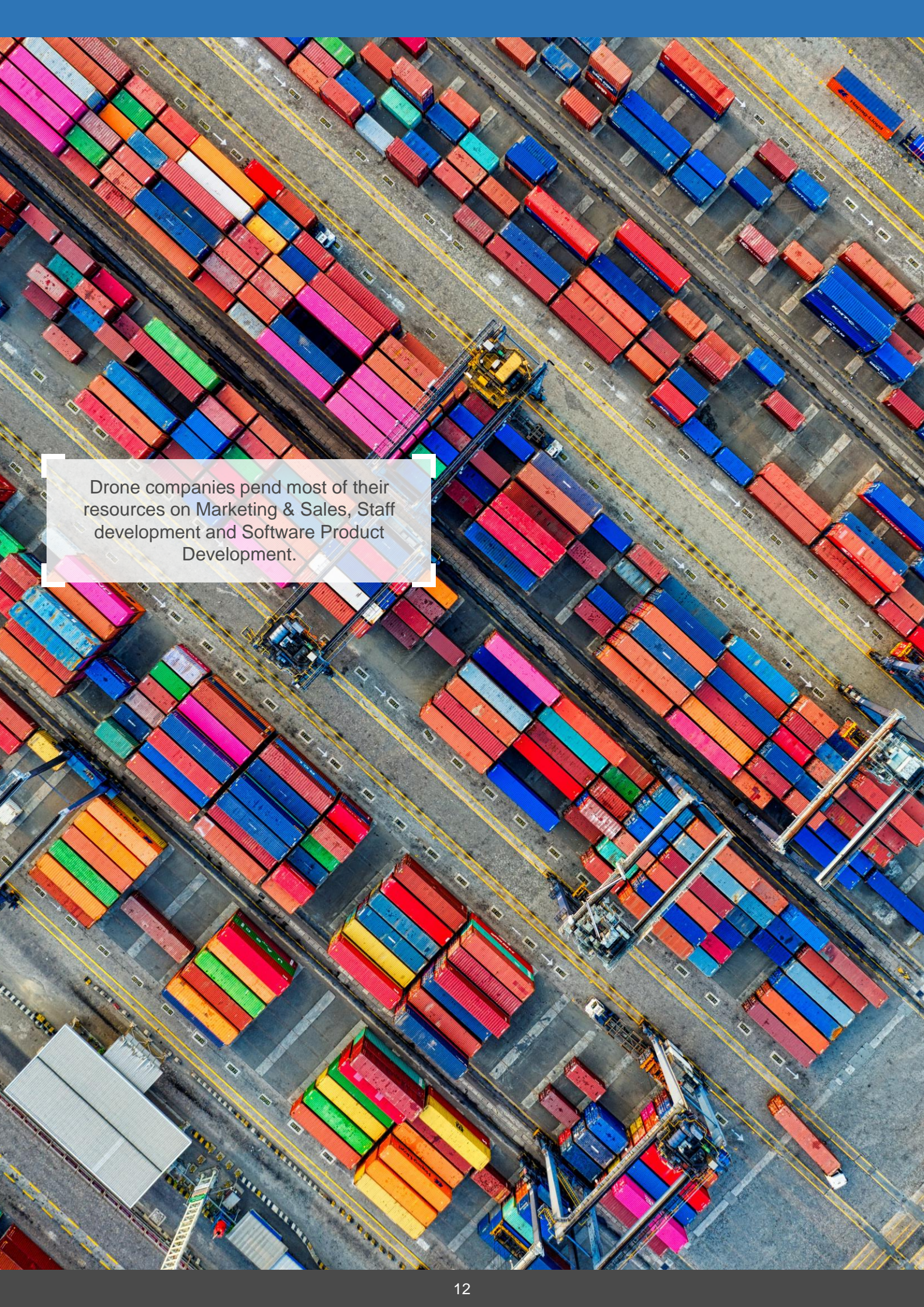


Fig. 7: Market Development in the Last and Next 12 Months by Market Segment (n=1011)



Drone companies spend most of their resources on Marketing & Sales, Staff development and Software Product Development.

RESOURCES

Which resources do drone companies prioritize? To see what are they mostly investing their time and energy on, we asked drone companies for their priorities regarding resource-allocation. Figure 9 shows their resource distribution priorities.

This year's results once again show that **marketing & sales** is the leading priority for the next 12 months. This has been perhaps the strongest trend over the years when we have carried out this survey.

Which of these are your company's top priorities for the next 12 months? (Multiple selection possible)

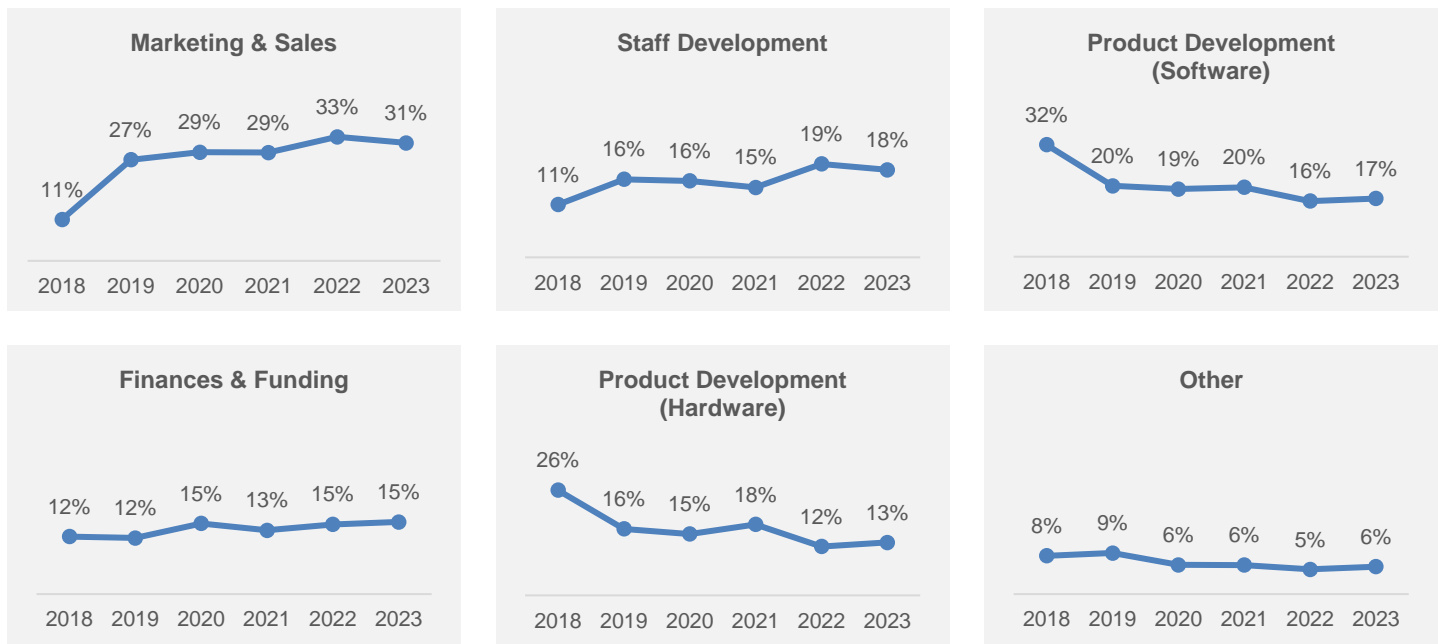


Fig. 8: Survey Respondents' Answers to What They Allocate Their Resources To (multiple answers possible, n=1011)

The level of importance in marketing has **tripled since 2018**, and this may be due to the fact that drone industry has continued to mature through a point where the focus is on advertising and selling of refined products and services rather than on developing them. Considerable amount of sophisticated hardware and software already exist in the market, which means that companies must focus more on their **USP (Unique Selling Point)** and therefore need to prioritize their communications and marketing.

Following marketing and sales efforts, the spotlight shifts to **staff development** as the second most prominent priority. This corresponds with our [investigation into drone jobs](#), which underscored a noticeable surge in drone-related employment in recent years. And in the current landscape, the imperative to prioritize staff development has grown even more pronounced, particularly due to the heightened competition for individuals with precise qualifications.

Given the escalating significance of marketing, it comes as no surprise that the emphasis on **product development** has dwindled by half since 2018. Four years ago, hardware development held the lead position, capturing 26% of respondents' attention, while software development followed closely at 32% (both surpassing marketing at 11%). Today, these figures have receded to 13% and 17%, respectively, while marketing and sales have surged to a prominent 31%.

Across the past years, there has been a gradual upswing in companies' dedication to channeling resources toward **finances and funding**. However, it's accurate to assert that this focus has largely maintained its stability.

Lastly, the **"Other"** category encompasses various areas such as international expansion, enhancing drone operations, fostering business development, acquiring new drones, and staff training, among others.

Next to Regulatory obstacles and public acceptance, drone companies see the current inflation crisis as one of the biggest challenges for the drone industry.



BIGGEST CHALLENGE OF THE INDUSTRY

Which of these do you consider to be the biggest challenge for the industry as a whole?

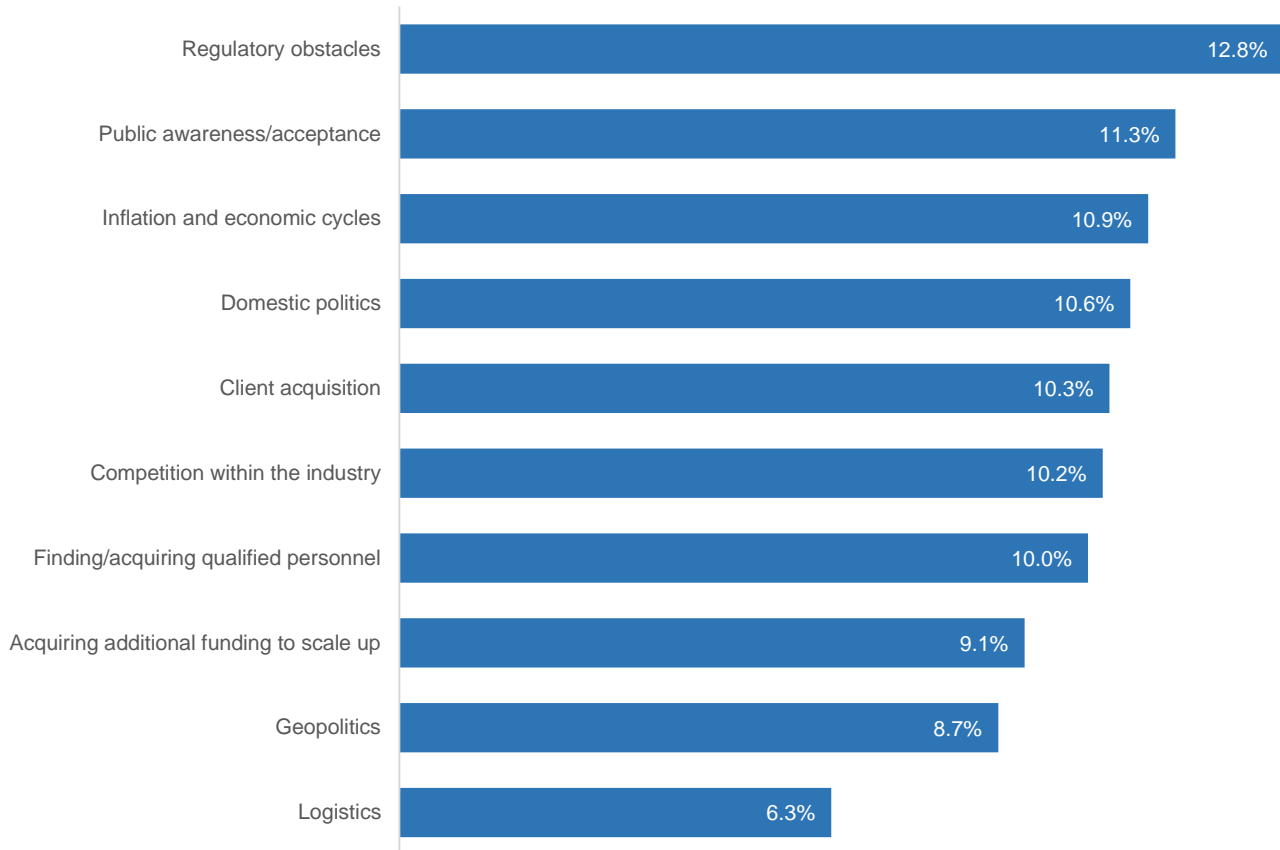


Fig. 9: Biggest Challenge for the Industry (n=997)

This year we added a new question asking drone professionals to rank the biggest challenge for the drone industry as a whole. The results are shown in Figure 10 and they definitively present **regulatory obstacles** as the biggest challenge. To drone professionals and especially drone operators, this is likely far from a surprise. The second biggest challenge according to respondents is equally well-known within the industry: **public acceptance/awareness of drones**. Many experts who have

talked to average citizens are familiar with the privacy and noise fears that some people immediately associate with drones, and it will be a continued global challenge to educate society on why these concerns are often exaggerated and unnecessary. **Inflation and economic cycles** was the third of the top three challenges for the industry, though **domestic politics** was very close behind.



Again, the focus is on rule-making authorities as the main market-driving actors.

DRIVING FACTORS IN A DYNAMIC MARKET

Much in line with the top challenge, and along the same thread as in previous years, the survey determined that the top market-driving factor according to participants is **rule-making authorities**. The share of this factor has increased to 52% from 45% last year, and it is also worth noting that the decrease from 2021 to 2022 was due to a new factor being included in the survey last year (i.e. drone associations). The fact remains that for companies to scale their business within the commercial drone space, having appropriate regulations in place is vital.

Interestingly, **hardware manufacturers** (47%) have seen an increased level of importance in the two years where China was a major participant in our survey (2021 and 2023). Though there are of course other reasons why participants might have ranked these companies higher, the Chinese influence on hardware-related topics is nevertheless noteworthy.

In third place, and continuously gaining importance, we find **drone operators/DSPs** (45%). Since this is the cohort that actually operates and uses drones the most, it makes perfect

sense for these to be considered among the top 3 market-driving factors.

Software manufacturers have remained in a steady 4th place position over the years without much significant diversion. This does not mean that they are un-important (especially given their steady rank at 4th place), but it does show that the top three market-driving factors are rather firm in the industry's mind.

It may initially seem surprising to find **organizations of safety concepts** (e.g. JARUS, ASTM) ranked so low, especially since these might sound like regulatory bodies. However, it is precisely because they focus on concepts and design rather than regulatory authority that these are considered less influential. They are of course, nevertheless important components of the industry, much like the other factors listed.

Market driving actors in "other" category include customers/end-user, workforce training, [adoption of BVLOS](#), media, technology applicator, etc.

What are the most important market-driving factors?

(Multiple selection possible)

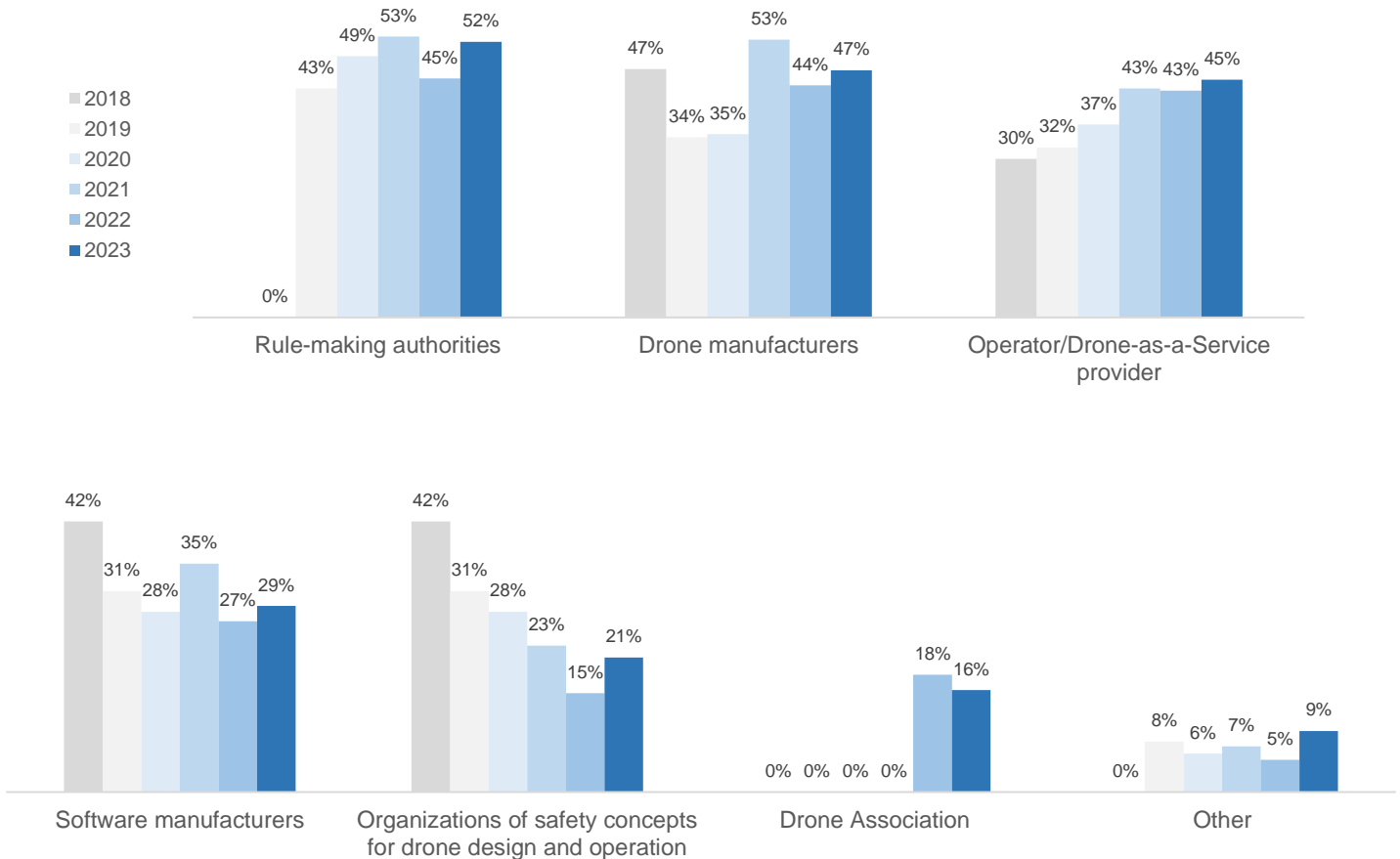


Fig. 10: Survey Respondents' Assessment of the Most Important Market-Driving Actors in the Drone Industry (multiple answers possible; n=1011)

¹Drone Association was included as an option in industry barometer survey since 2022.

ABOUT

Drone Industry Insights is the leading market research and analytics company for commercial drones. Our core business is to create new knowledge in the field of unmanned systems. Our comprehensive understanding of the commercial drone market combined with a global view enables us to create industry reports and bespoke market studies. We combine more than 40 years of experience in manned and unmanned aviation and other relevant industries.

The survey that this report is based on was conducted from the beginning of May 2023 until the end of June 2023 and distributed by industry partners, drone coalitions, alliances, and initiatives around the world. We are deeply grateful for the support from all of our partners for this year's survey, who help ensure that this unique report reaches all corners of the globe. These partners for 2023 are:

Supporting Partners for Survey Distribution



In particular, we extend a special thanks to our partner drone events, who provided tickets to their events in exchange for participation:



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