

RETHINKING BUILDINGS POST-COVID-19

Focuses on COVID-19's impact on building trends and facility managers' priorities – now and in the future

Honeywell 2021
Building Trends Series

Honeywell

OVERVIEW

To say that life will never return to “normal” following COVID-19 is to potentially belabor the obvious. Among its countless global impacts — some of them positive — the pandemic has prompted 71% of surveyed facility managers in the United States, China, Germany and Saudi Arabia who operate buildings across the education, healthcare, data center and commercial real estate sectors to permanently rethink their facility’s mode of operation. We believe this will have a lasting impact on building occupants’ experiences and well-being.

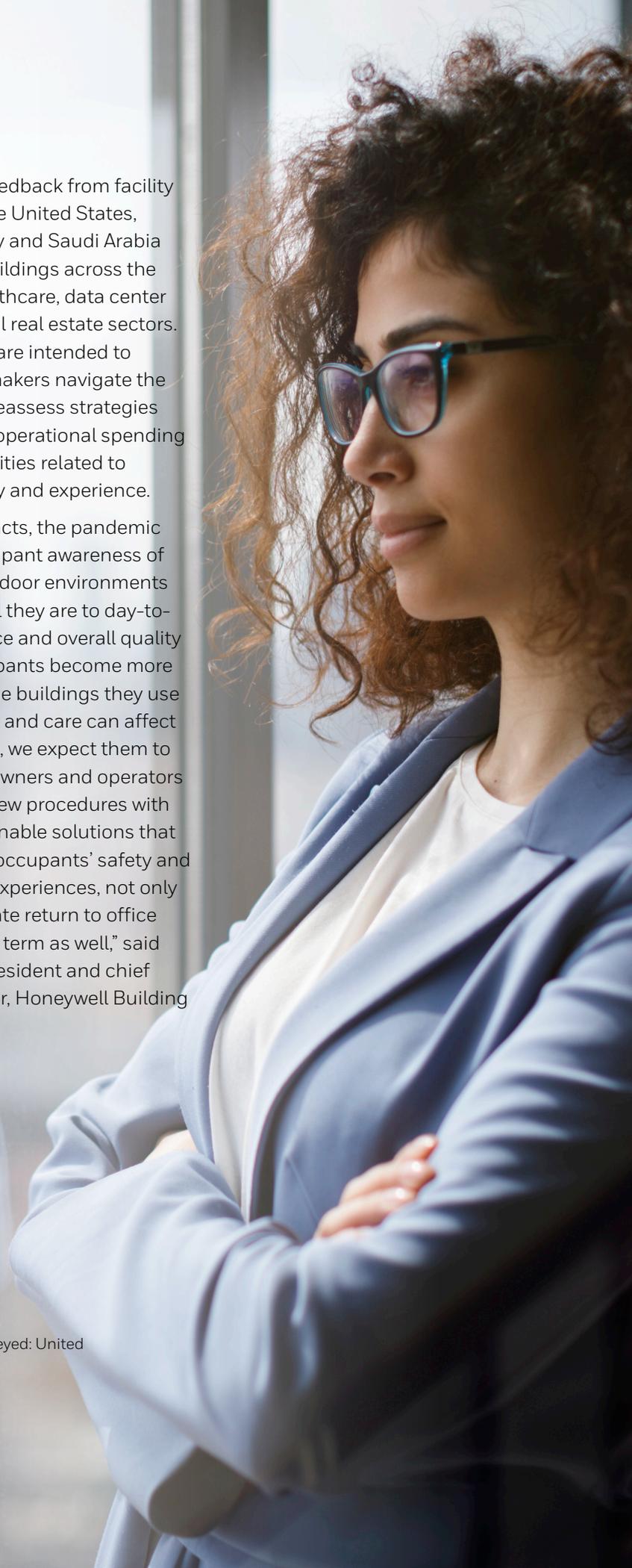
A recent survey conducted by Honeywell Building Technologies between March and May 2021 revealed the challenges, concerns and priorities of facility managers globally¹. Globally, six in 10 respondents, for example, are now more likely to invest in technologies that optimize indoor air quality (IAQ) and other aspects of occupant health and safety, while 63% are more willing than pre-COVID-19 to implement smart building solutions that help drive efficiency or support sustainability.

This report, the first in Honeywell’s 2021 Building Trends series, focuses on COVID-19’s impact on surveyed facility managers’ strategies and practices. The results

are based on feedback from facility managers in the United States, China, Germany and Saudi Arabia who operate buildings across the education, healthcare, data center and commercial real estate sectors. These insights are intended to help decision makers navigate the future as they reassess strategies for capital and operational spending and revisit priorities related to occupant safety and experience.

Among its impacts, the pandemic has raised occupant awareness of conditions in indoor environments and how critical they are to day-to-day performance and overall quality of life. “As occupants become more aware of how the buildings they use for work, school and care can affect their well-being, we expect them to push building owners and operators to implement new procedures with efficient, sustainable solutions that better support occupants’ safety and enhance their experiences, not only for the immediate return to office but for the long term as well,” said Vimal Kapur, president and chief executive officer, Honeywell Building Technologies.

¹By “global” we refer to the total percentage across all countries surveyed: United States, China, Germany and Saudi Arabia.



TOP THEMES EMERGING AROUND THE WORLD

From a global perspective, COVID-19-related health and safety issues remain a top concern across all sectors in Germany, Saudi Arabia and the United States, whereas in China, surveyed facility operators appear to have moved beyond the pandemic. While willingness has increased worldwide to invest in

healthier, safer building solutions since the onset of COVID-19, surveyed German managers in particular find it challenging to secure the budgets they need to implement these technologies. Their surveyed U.S. counterparts rank remote management among their top COVID-19-related challenges

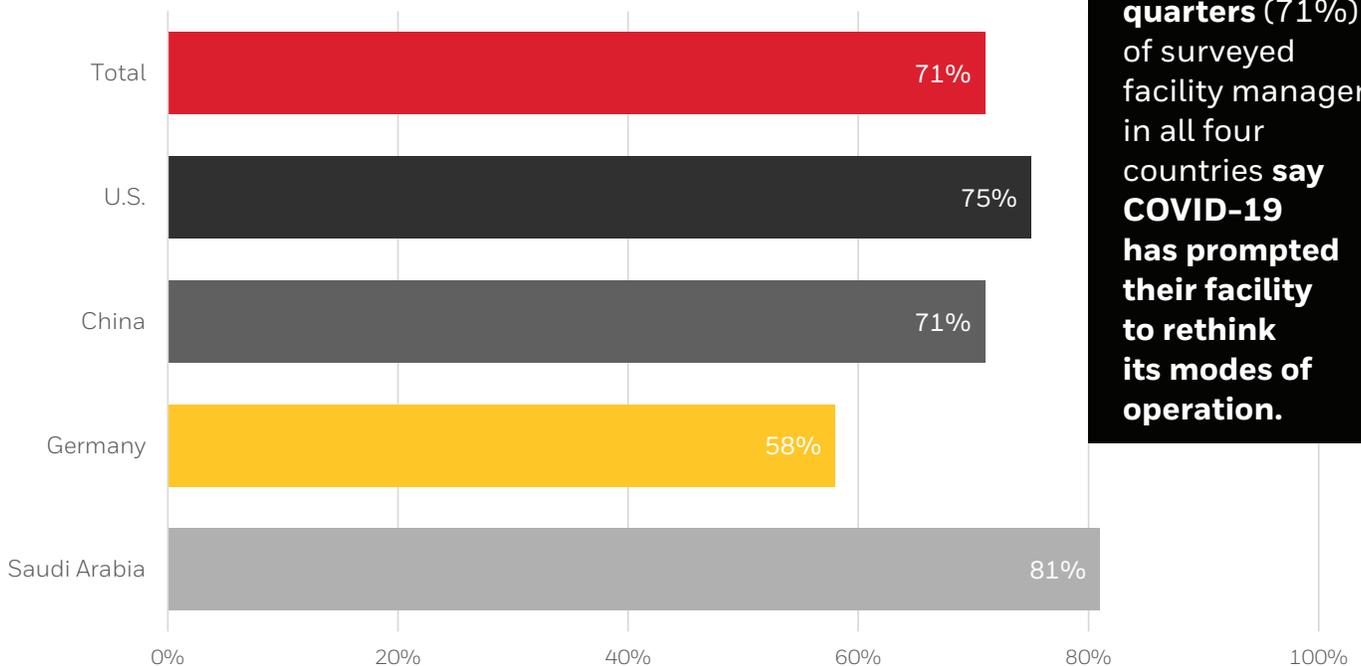
and list it as one of their most sought-after upgrades. Surveyed Saudi managers say unplanned downtime caused primarily by power and network outages has hampered their efforts to remain operational during the pandemic.





#1 The pandemic will likely have lasting impact on facility management and operations

COVID-19 Has Caused Facilities to Permanently Rethink Operations



Nearly three-quarters (71%) of surveyed facility managers in all four countries say COVID-19 has prompted their facility to rethink its modes of operation.

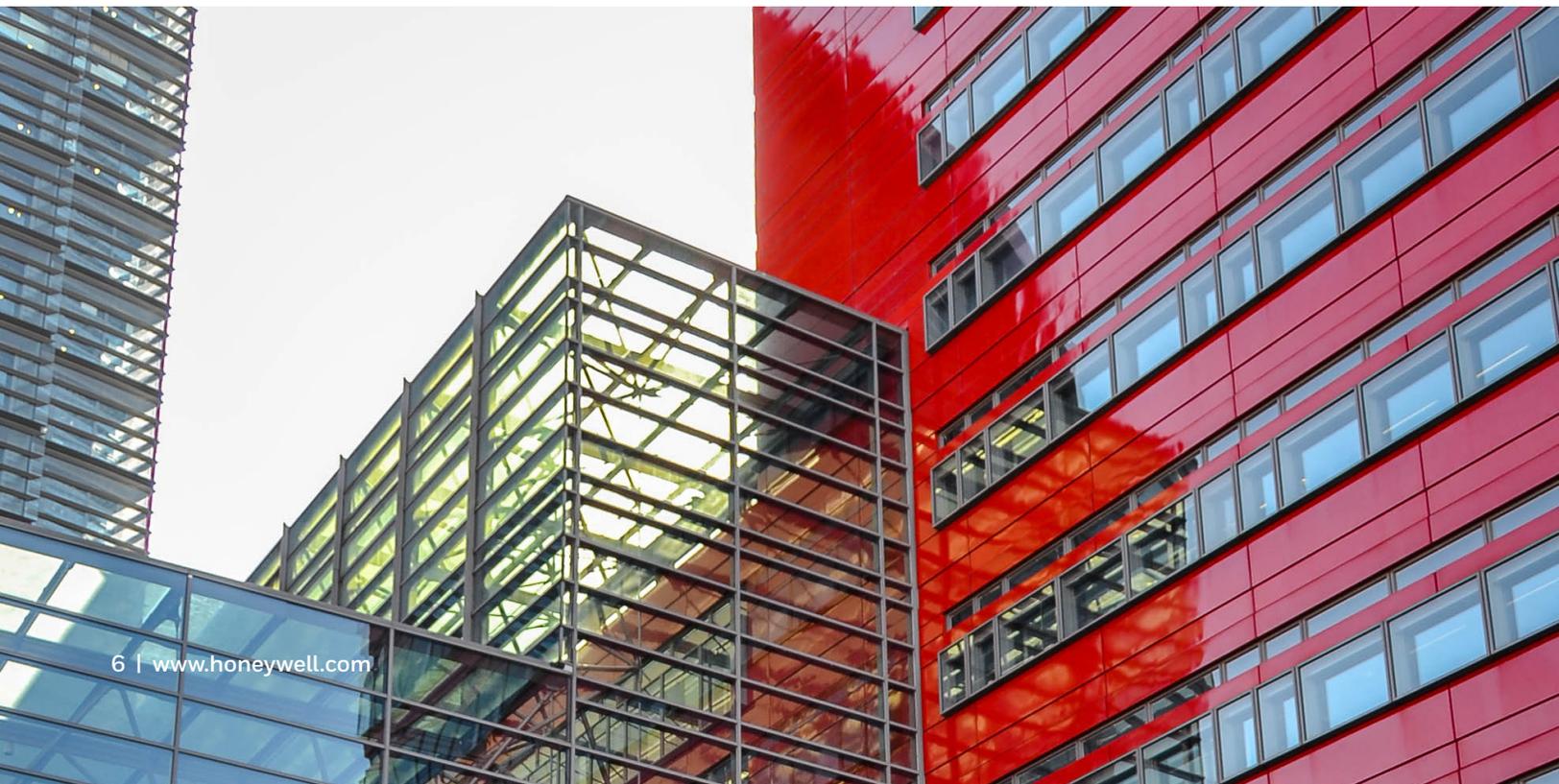
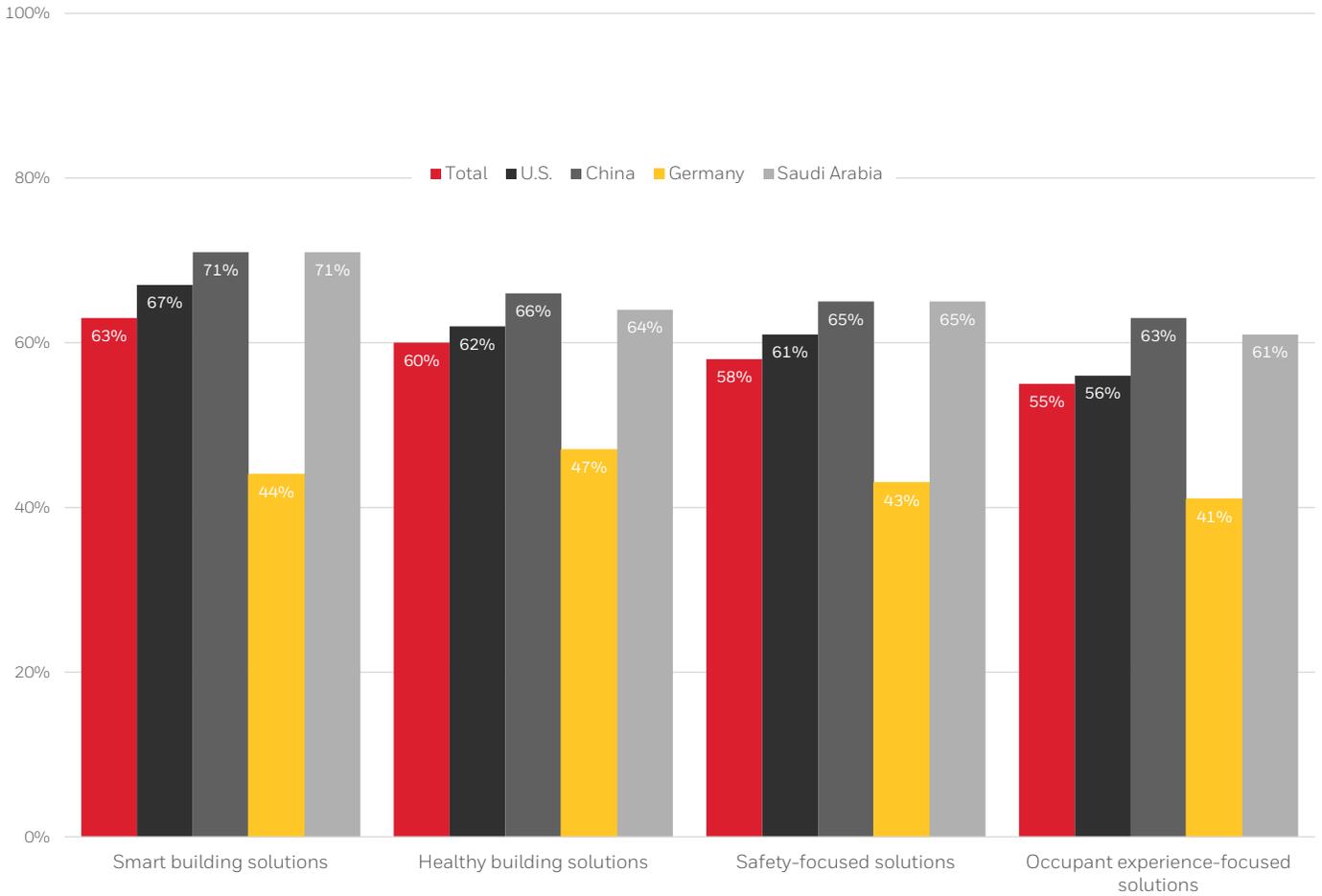
Many believe changes and upgrades made during the pandemic will be kept in place in some form. In fact, 37% of global respondents expect updates to the air quality system to remain permanent.

	Total		U.S.		China		Germany		Saudi Arabia	
	Implemented	Permanent	Implemented	Permanent	Implemented	Permanent	Implemented	Permanent	Implemented	Permanent
Health safety protocols such as social distancing	54%	33%	57%	32%	56%	34%	40%	21%	63%	48%
Enhanced cleaning procedures	53%	36%	51%	36%	51%	36%	48%	29%	63%	46%
Health screening protocols such as temperature checks	51%	31%	50%	28%	57%	31%	37%	23%	60%	47%
Updates to air quality system	47%	37%	46%	36%	54%	43%	38%	29%	52%	41%
Contactless access control	44%	29%	41%	28%	43%	28%	40%	24%	55%	37%
Technology for contact tracing	40%	24%	40%	24%	39%	24%	37%	20%	46%	29%
App with real-time building information	36%	20%	30%	16%	43%	26%	27%	11%	47%	28%



#2 COVID-19 is driving facility managers to adjust their priorities and investments

More Willing to Invest Now vs. Before COVID-19



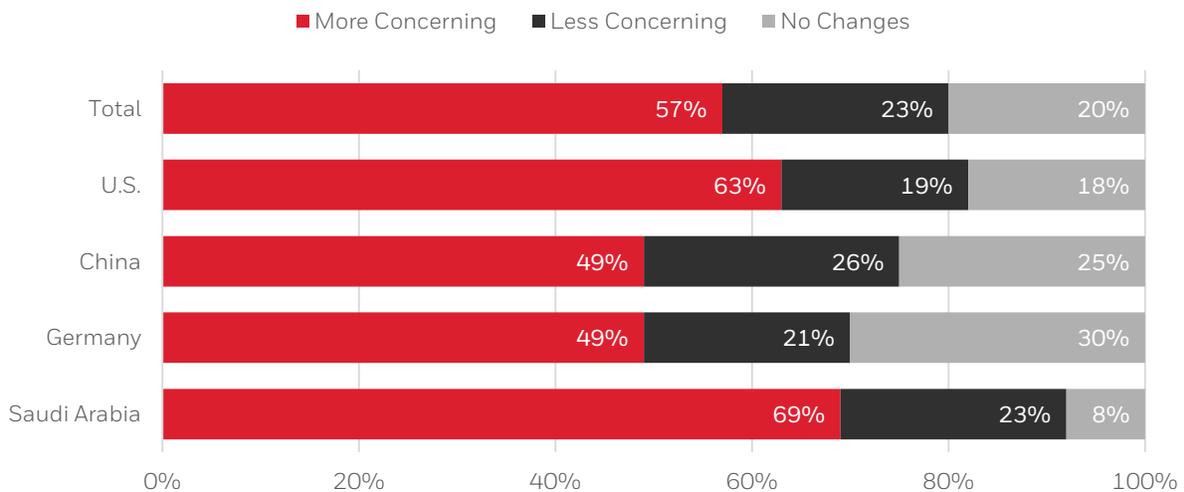
#3 COVID-19 remains a source of widespread unease

Most surveyed facility managers in Germany, Saudi Arabia and the United States cite pandemic-related issues as their top worry. In China, maintenance, repairs and safety are the respondents' top concerns.

	United States	China	Germany	Saudi Arabia
1	COVID-19 pandemic-related 22%	Maintenance & repairs 23%	COVID-19 pandemic-related 17%	COVID-19 pandemic-related 25%
2	Safety concerns 18%	Safety concerns 18%	Safety concerns 14%	Efficiency & customer satisfaction issues 18%
3	Efficiency & customer satisfaction issues 14%	Efficiency & customer satisfaction issues 15%	Managing costs & securing funding 11%	Safety concerns 13%
4	Maintenance & repairs 10%	Managing costs & securing funding 12%	Efficiency & customer satisfaction issues 9%	Staff or employee management concerns 9%
5	Staff or employee management concerns 10%	Staff or employee management concerns 10%	Supervising facility 9%	Managing costs & securing funding 7%

In Saudi Arabia and the United States, a sizable majority of surveyed facility operators say managing their buildings has become more of a worry since March 2020. In China and Germany, 49% of their counterparts agree.

Facility Management Concerns: More or Less Concerning Over Past 12 Months

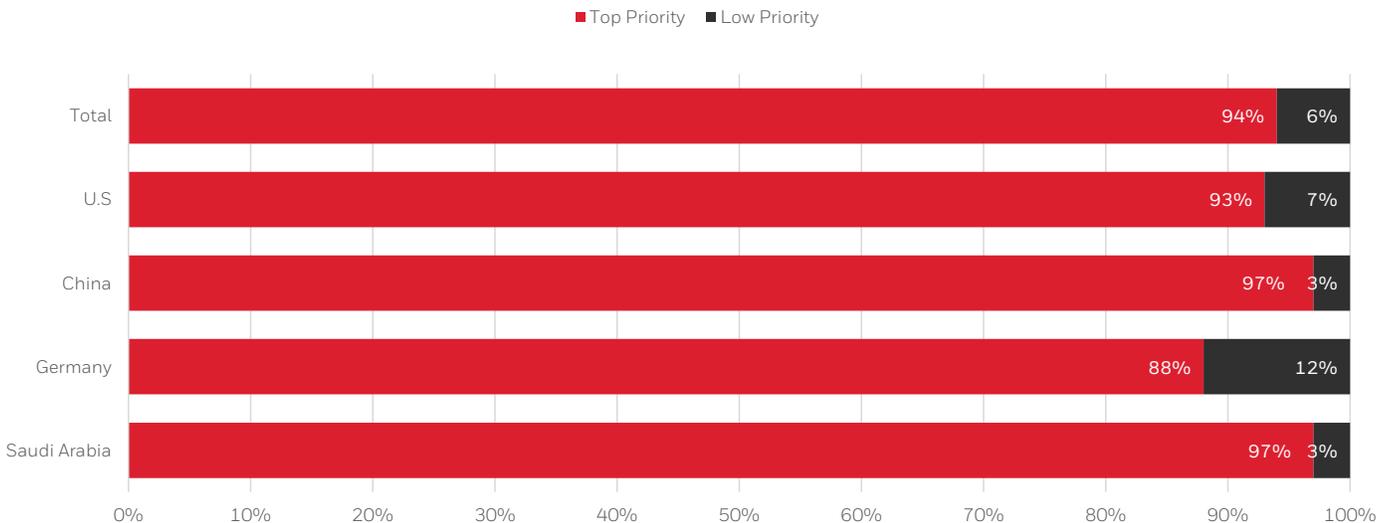




#4 A healthy building is a top priority and will remain important

More than nine in 10 (94%) of global respondents consider a healthy building an important priority right now. When respondents are asked if a healthy building will continue to be a top priority after the pandemic has subsided, the number shifts only slightly — by just one percentage point (93%).

Healthy Buildings' Rank Among Facility's Priorities Right Now

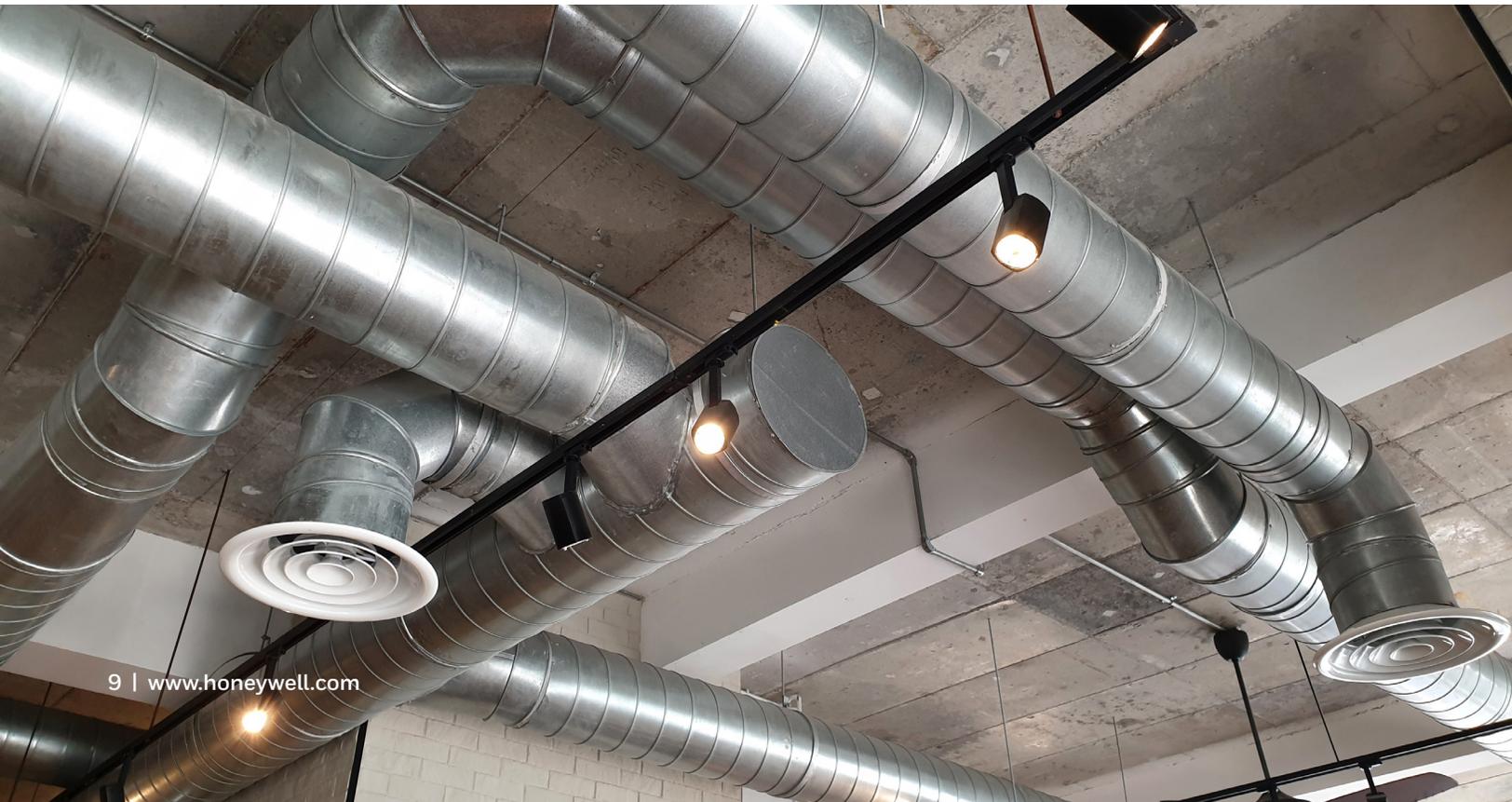
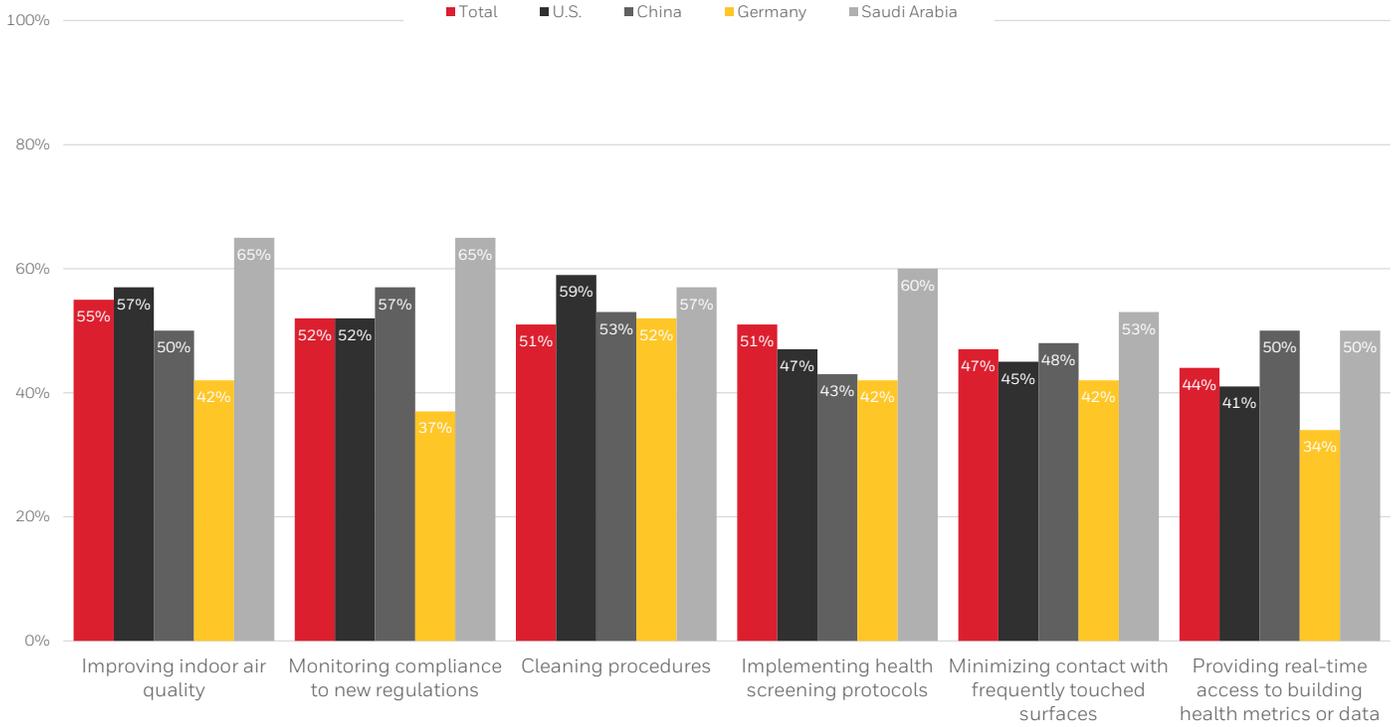


Indoor air quality ranks first among elements of a healthy building

Across all surveyed countries and surveyed sectors, 55% of surveyed managers rank optimized IAQ as the most important element of a healthy building, driven largely by those working in healthcare (60%) and

commercial real estate buildings (59%). Interestingly, only Saudi managers rank IAQ as their top priority; cleaning procedures received top mention in Germany and the United States.

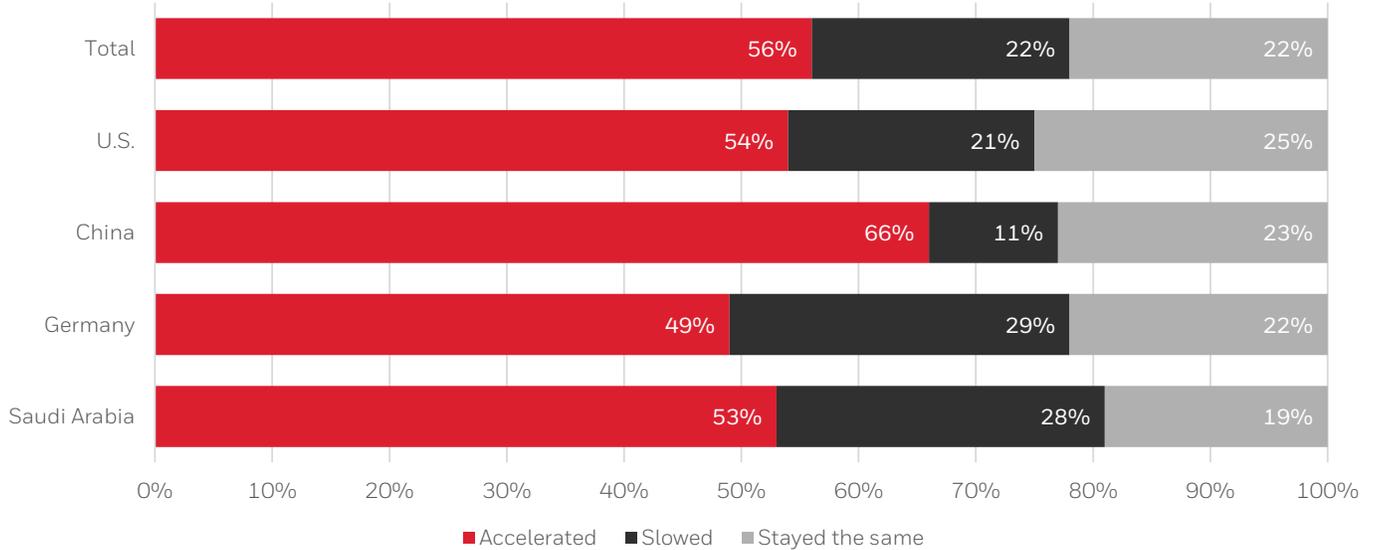
Most Important "Healthy Building" Aspect by Country



#5 Digital transformation is accelerating

Since the onset of COVID-19, more than half (56%) of global respondents have seen digital transformation accelerate in pace. That number is even higher in China (66%).

Rate of Digital Transformation Since COVID-19



Ninety-four percent of global facility managers say remote facility management is important now and 63% of respondents are more willing to invest in smart building solutions that drive efficiency or sustainability, such as data aggregation, machine learning and artificial intelligence.

#6 Respondents are interested in upgrades to improve the occupant experience

A number of areas ranked high across the countries, including creating an inviting and innovative building experience, energy-efficient and sustainable solutions and improved air quality. Contactless experience topped the list in the United States and Germany. or sustainability, such as data aggregation, machine learning and artificial intelligence.

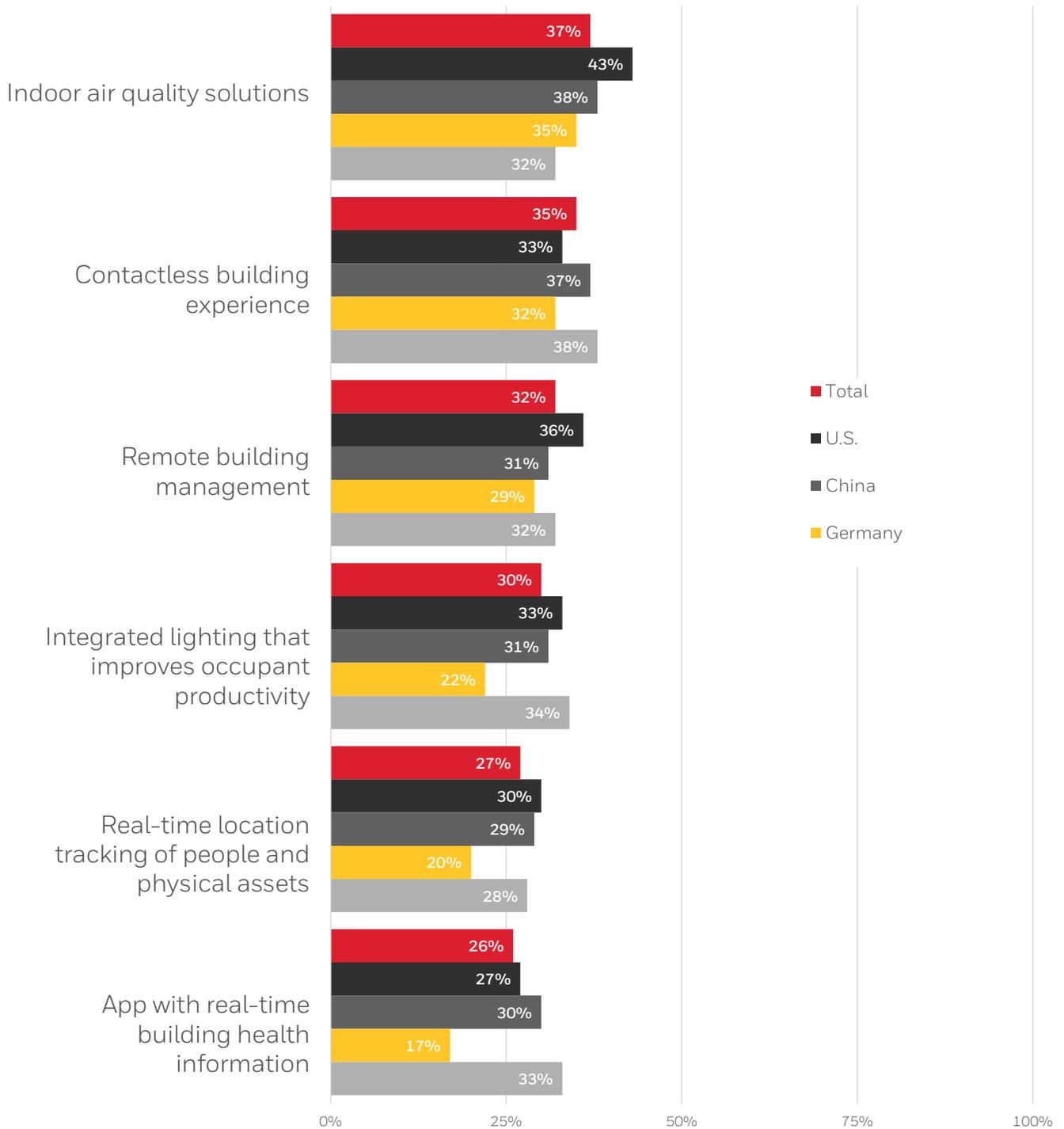
	U.S.	China	Germany	Saudi Arabia
An inviting and innovative building environment	✓	Ranked #1*	✓	Ranked #1*
Energy-efficient and sustainable solutions		✓	✓	
Solutions focused on compliance with new health and safety regulations	✓			✓
Improved indoor air quality	✓	✓		
Life safety systems that drive faster responses		✓		✓
Spaces that are flexible and converted based on occupant needs				✓
Contactless building experience	Ranked #1*		Ranked #1*	

**when forced to choose the most important upgrade*

Current building solutions landscape

Respondent input also showed a gap in the technologies currently deployed in buildings. Although 93% of surveyed facility managers say that improved air quality is important to occupants and stakeholders, only 37% have systems in place right now. Similarly, although 90% of surveyed facility managers say that contactless building entry and experience is important, only 35% currently have it in place.

Current Solutions or Technology in Place at Facility



TOP BUILDING TRENDS WITHIN COUNTRIES

KEY FINDINGS

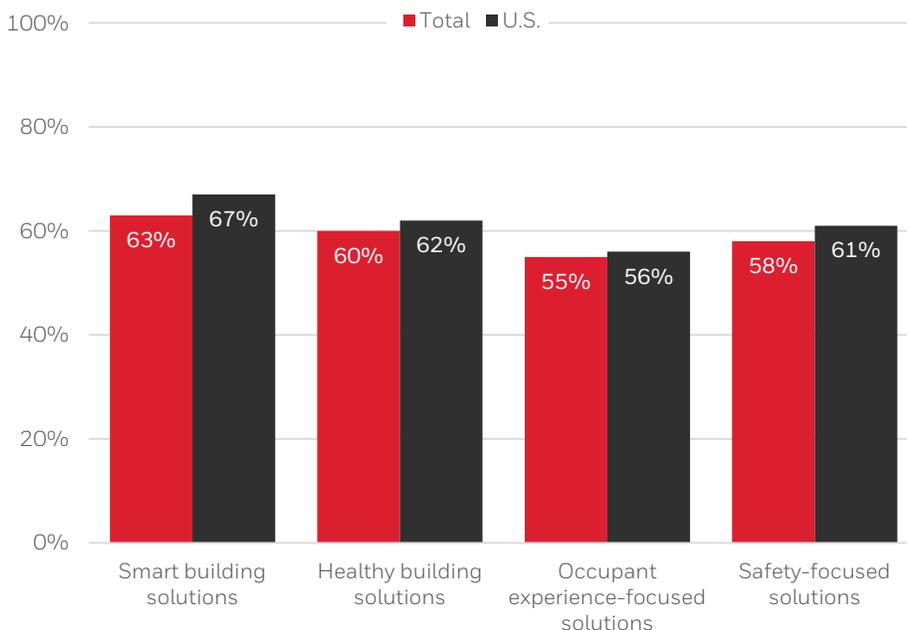
United States

Most surveyed U.S. managers have seen digital transformation accelerate during the pandemic, yet U.S. facilities do not have consistent building technologies in place today. Nearly half have security solutions implemented, but a third or less have features such as apps to monitor building health or real-time location-tracking of people and assets.

Healthy buildings are a priority for U.S. facility managers. Improving indoor air quality ranks as the most important aspect of a healthy building for those working in healthcare and educational facilities, while those working in data centers and commercial real estate buildings cite cleaning procedures as their top priority.

COVID-19 has had a major impact on priorities and investments at U.S. facilities. Two-thirds (67%) of respondents are more willing to invest in smart building solutions that drive efficiency or sustainability, such as data aggregation, machine learning and artificial intelligence. More than six in 10 (62%) are more likely to invest in indoor air quality optimization and other healthy building solutions, and 56% are more willing to invest in occupant experience solutions like contactless building access, smart parking and personalized experiences. Remote facility management is also becoming more important with 93% of surveyed U.S. facility managers saying it is now important.

More Willing to Invest Now vs. Before COVID-19



75%
say COVID-19 has caused facilities to permanently rethink operations

62%
more likely to invest in healthy building solutions such as indoor air quality optimization, **67%** now more willing to invest in smart buildings

22%
say pandemic-related issues are a top concern

54%
say digital transformation has accelerated

62%
say healthy buildings will continue to be a top priority post-pandemic

57%
say buildings do not have air quality solutions, **73%** say buildings do not have app for real-time building health

TOP BUILDING TRENDS WITHIN COUNTRIES

KEY FINDINGS

China

Surveyed Chinese facility managers rank challenges and concerns differently than in other markets, putting less emphasis on COVID-19. Among surveyed Chinese facility managers, nearly two-thirds (62%) are very confident that their buildings are safe for occupants to use as the pandemic continues and only 5% note pandemic-related issues as their top concern, a significantly lower number than respondents from other countries.

While confidence is high, more than half of Chinese respondents (58%) say a healthy building is a top priority now and will remain so after the COVID-19 pandemic. Similarly, being a smart building will also continue to be a top priority for nearly half of respondents (47%) beyond the pandemic.

According to 66% of respondents, digital transformation has accelerated in pace since COVID-19 as the need for remote facility management becomes more acute. Nearly all surveyed facility managers

(98%) say that remote facility management is important now and 71% of respondents indicate they are more willing to invest in smart building solutions that drive efficiency or sustainability, including data aggregation, machine learning and artificial intelligence.

Approximately 96% of surveyed Chinese facility managers across all four sectors say an inviting and innovative building environment is important for attracting and retaining occupants or stakeholders.

While China has largely put COVID-19 behind it, two in three surveyed managers say they are now more willing to invest in healthy (66%) and safety-related (65%) solutions than they were prior to the pandemic. Additionally, four in five facilities plan to provide new training for their workforce in the coming year to bring employees up to speed with healthy buildings, cybersecurity solutions and other digitally informed technologies.

71%

say COVID-19 has caused facilities to permanently rethink operations

54%

updated air quality; **43%** say upgrades will be permanent

71%

are now more willing to invest in smart buildings

Maintenance and repairs are the top concern

57%

say healthy buildings will continue to be a top priority post-pandemic

66%

say digital transformation has accelerated

More Willing to Invest Now vs. Before COVID-19



TOP BUILDING TRENDS WITHIN COUNTRIES

KEY FINDINGS

Germany

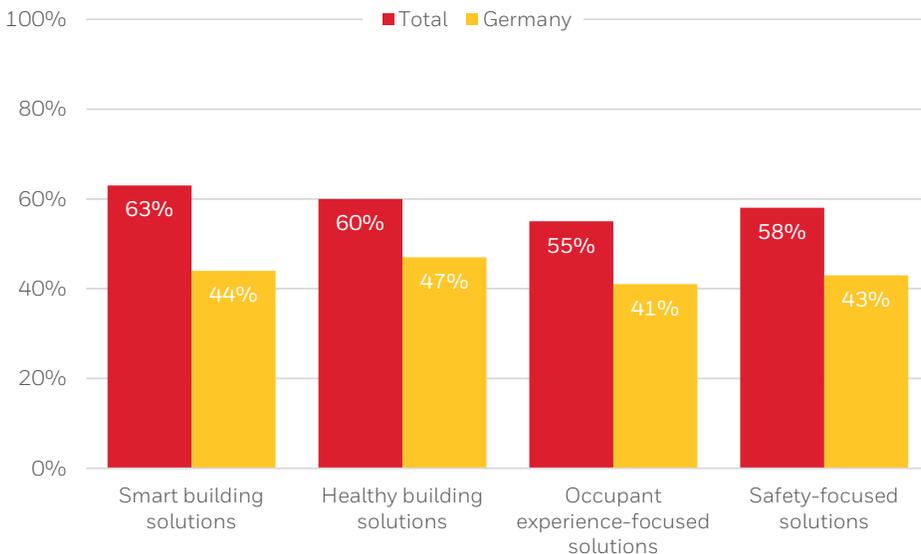
More than half (58%) of surveyed managers in Germany say COVID-19 has caused their facility to permanently rethink how it operates. Of several investments facilities have made in response to the pandemic, at least half are expected to remain permanently — in particular, upgrades to air quality systems, enhanced cleaning procedures, contactless access and health-screening protocols.

Concerns related to COVID-19 are common among managers in all sectors, particularly in commercial real estate. German respondents across all sectors mention budget as their greatest challenge. Securing the financial resources they need to operate their facilities properly and upgrade them to current technological standards causes them the greatest concern — more so, in fact, than for U.S. or Saudi Arabia respondents.

Only four in 10 surveyed managers say having a healthy building is a top priority right now, yet 43% are very confident that their building is safe for occupant use as the pandemic continues. Improved IAQ is an important goal in this area, in part because the great majority (87%) see it as one of the best means of attracting and retaining occupants and stakeholders. However, only 35% currently have IAQ solutions in place, indicating a large technology gap.

The impact of COVID-19 extends to how buildings are managed as well. Nine in 10 managers want the ability to manage their facility remotely. Looking ahead, nearly half (47%) of those surveyed are more willing to invest in healthy building solutions, and 41% are more likely to invest in upgrades that enhance occupant experience, such as a contactless building.

More Willing to Invest Now vs. Before COVID-19



92%
say that creating an inviting and innovative building environment is key to attracting occupants

only
35%
have IAQ solutions in place; **38%** have updated air quality; **29%** say upgrades will be permanent

COVID-19 pandemic and safety are top concerns

46%
say healthy buildings will continue to be a top priority post-pandemic

47%
more now willing to invest in healthy buildings

Cleaning procedures and improving IAQ are most important aspects of healthy buildings

TOP BUILDING TRENDS WITHIN COUNTRIES

KEY FINDINGS

Saudi Arabia

More than four in five managers in Saudi Arabia say COVID-19 has caused their facility to permanently rethink how it operates. Health safety and screening protocols and enhanced cleaning procedures are common changes that are likely to remain in place post-pandemic.

Although the pandemic has been a source of widespread concern for surveyed facility managers across all sectors in Saudi Arabia, 71% feel very confident that their facility is safe for occupants to return. More than half (69%) surveyed Saudi facility managers rank a healthy building among their top priorities, and 57% note improving IAQ as one of the most important element of building health.

When asked which upgrades they plan to invest in during the next 12 to 18 months, Saudi managers mention indoor air quality solutions (35%), an app with real-time building health information (35%) and remote building management (34%).

However, facilities managers in Saudi Arabia are still facing numerous challenges, with remote management topping the list (75%). Other top challenges include implementing upgrades or new solutions (71%), keeping pace with technological change (69%) and creating a healthier, safer environment for occupants (66%).

81%
say COVID-19 has caused facilities to permanently rethink operations

52%
have updated air quality; **41%** say upgrades will be permanent

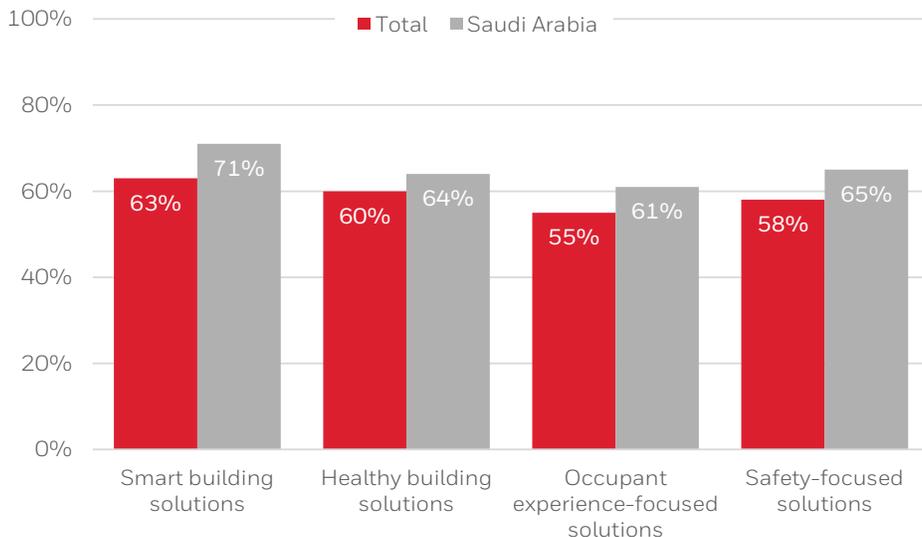
71%
are now more willing to invest in smart building solutions

COVID-19 pandemic, efficiency and customer satisfaction issues are top concerns

69%
rank healthy buildings as a top priority right now

57%
noted improving IAQ as one of the most important aspect of healthy buildings

More Willing to Invest Now vs. Before COVID-19



HEALTHIER BUILDING ENVIRONMENTS: A PATH FORWARD

Digital transformation, driven primarily by the need to aggregate and analyze vast amounts of information, is laying the groundwork for monitoring and controlling indoor environments to a degree that was inconceivable even a year ago. This alignment benefits facility managers across all four countries and sectors surveyed; investments in a smarter building synergize strategically with investments in an approach to a healthier building.

A case in point: Pittsburgh International Airport partnered earlier this year with Honeywell Building Technologies to test air

quality control technology enabled by Honeywell's Healthy Buildings dashboard. The dashboard integrates seamlessly into the airport's existing systems, measuring temperature, humidity, carbon dioxide, particulate matter and volatile organic compounds.

A network of sensors provides real-time updates on air quality to help airport managers quickly identify and correct critical building controls issues. Software provided by Honeywell Forge is used to enable condition-based maintenance of MERV 13 filters, which helps reduce costly and unnecessary filter changes.

Honeywell Forge proactively analyzes building controllers and mechanical assets and provides near real-time insights via intuitive dashboards that can reduce unplanned reactive work on building systems. In the future, travelers will be able to benefit by visually seeing the building health information in a user-friendly dashboard.

Putting smart technology to work with innovations like the dashboards epitomizes what facility managers around the world reported in this survey – that the time to prioritize healthier indoor environments and occupant well-being is now.



METHODOLOGY

On behalf of Honeywell, KRC Research (<http://www.krcresearch.com/>) conducted an online survey of 1,554 facility managers in the United States, China, Germany and Saudi Arabia spanning the education, healthcare, data center and commercial real estate sectors.

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