



WFH in the Age of Coronavirus

Lessons for Today and Tomorrow

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Introduction, Background, and Highlights

Construx Software surveyed software professionals to determine the effect that working from home (WFH) during the coronavirus pandemic is having on software development. Our survey explored changes in communication and the impact on individuals, on teamwork, on leaders' ability to lead, and on specific technical practices.

The context was sobering, with most respondents reporting that they felt more disruption from personal stress related to coronavirus than they did from any aspect of changes related to working from home (Figure 1).

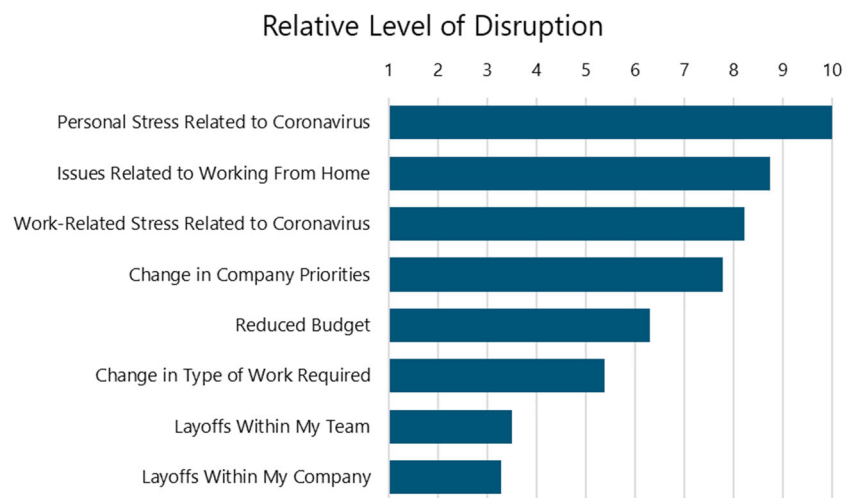


Figure 1 Sources of disruption.

Against this solemn backdrop, the challenges described were, for the most part, as expected. The responses to WFH were more surprising. Respondents detailed dozens of creative adaptations that are allowing them to WFH effectively. Some of the adaptations are specific to this time. Others offer lessons that will help companies improve their operations long into the future—with benefits that more than offset the challenges.

Our survey was focused specifically on software professionals. However, we believe most of the findings are broadly applicable to all companies with staff and leaders who WFH.

Survey Background

The survey was conducted from April 7 to April 22, 2020, with 624 respondents participating from 63 countries, mostly in the Americas and Europe (Figure 2).

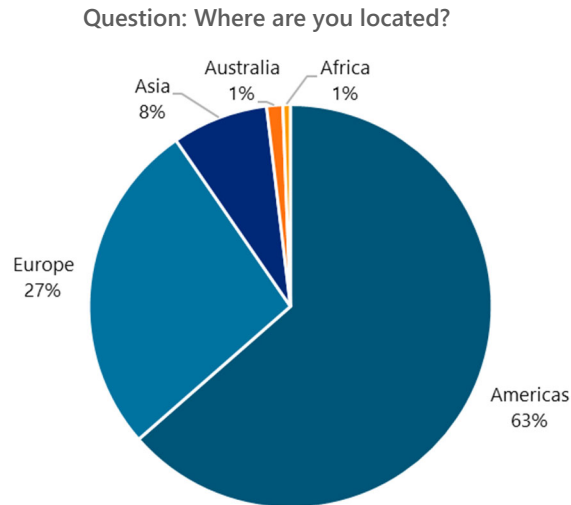


Figure 2 Regions participating in the survey.

Respondents averaged more senior than the industry average, with 32.7% in Manager or Executive roles (Figure 3).

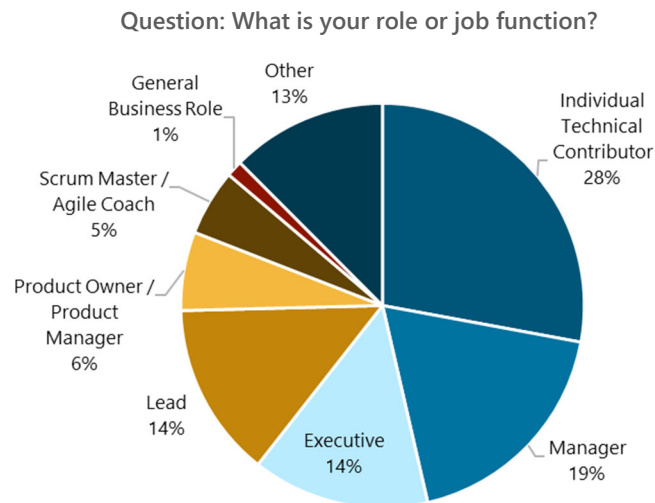


Figure 3 Roles of survey respondents.

Respondents contributed more than 7000 comments. While the numeric responses are useful, the written responses produced the survey's most significant insights.

Temporary and Permanent Changes in the Amount of WFH

A significant majority of respondents did not regularly WFH before coronavirus (78.6%). During coronavirus, 92.6% of people are WFH *Always/Almost Always*, and 97.8% are working from home when *Often* is included. These results are probably expected.

Perhaps less expected is what respondents predict will happen after coronavirus. Whereas only 21.5% worked from home Often or Always/Almost Always before coronavirus, 70.6% expect their teams to be working from home Often or Always/Almost Always when the pandemic is over. See the comparison between Before and Future Team Prediction in Figure 4.

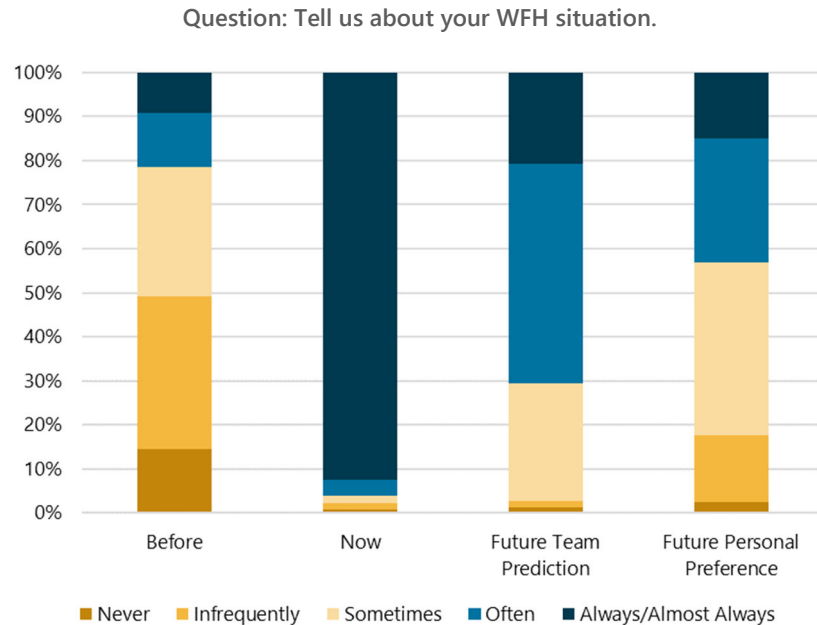


Figure 4 Past, present, and future frequency of WFH.

Learning from the Pandemic

We were encouraged by how many respondents chose to use the pandemic as an opportunity to learn new skills related to working from home. Respondents shared numerous lessons learned, which are detailed in the rest of this report.

General Communication and Connectivity

As expected, communication issues dominated written responses on the survey. Figure 5 shows relative frequency with which the 10 most common tools are used for general communication.¹

¹ The survey did not list specific tool names—all tool names were written by respondents. Respondents identified about 80 different tools they were using for day-to-day communication. For purposes of comparison, this report lists the 10 tools that were most commonly mentioned across all tools-related questions.

Long-Term Recommendations for WFH Based on Survey Findings

Recommendations for Individuals

While the recommendations that follow are for individuals, companies and leaders can support WFH by assisting individuals in these areas.

- Install adequate internet bandwidth
- Install computer equipment comparable to what is available in the office environment
- Install an ergonomic workspace
- Set clear expectations with housemates about when interruptions are allowable and when they are not
- Define a clear start and end to the work day
- Take regular breaks; go outside; exercise
- Allow yourself to attend to home and family issues as needed; adjust the work day if needed

Recommendations for Teams

- Have whole teams WFH on the same days, if possible
- Set clear expectations about each team member's work hours; respect that person's hours
- Allow team members to share aspects of their personal lives in remote team meetings
- Avoid WFH with newly formed teams
- Avoid WFH for teams that do not work well together
- Favor more in-person time for junior staff
- Favor in-person meetings for large-group activities
- Favor in-person meetings for complex activities such as front-end project activities
- For teams that WFH often, schedule virtual social times or in-person social times in addition to work-focused meetings

Recommendations for Leaders

- Develop your remote-leadership skillset
- Be explicit about your plan to support people and teams who are WFH; identify the factors that need to change compared to supporting people you see in person
- Remember to consider emotional needs as well as task-related needs
- Be conscious in choosing what you will try to accomplish remotely and what would be better to accomplish in person

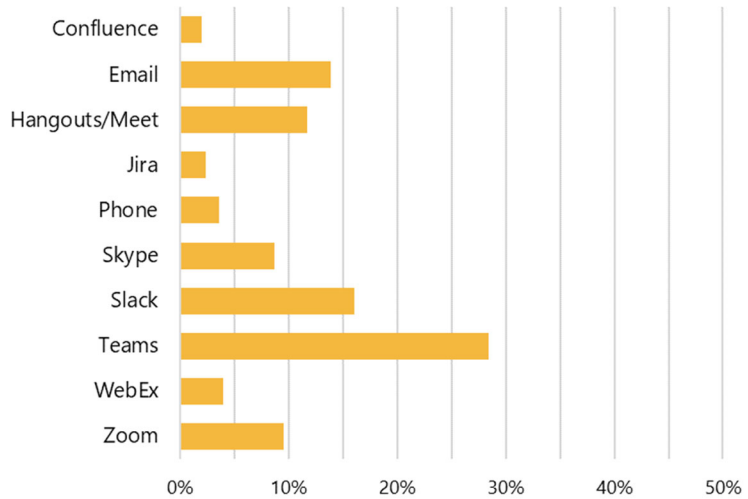


Figure 5 Most commonly used general communication tools.

Teams was the most common general-purpose tool, followed by Slack, Email, and Hangouts/Meet. The frequency with which each tool was used depended on the type of communication. Additional variations on tool usage are described later in this report.

Amount of communication

Some survey responses said that WFH had resulted in less communication, and an approximately equal number said it had resulted in more communication.

Communication difficulties

Respondents said that communication is more difficult due to loss of nonverbal clues. Misunderstandings are frequent, and small issues more often turn into bigger issues. Day-to-day activities such as looking at someone else’s computer desktop or sharing a test result are small nuisances.

Surprisingly rapid company-wide ramp-up with remote communication tools

Respondents said that WFH has forced everyone to learn the digital communication technology. Many expressed surprise at how quickly their teams and other stakeholders company-wide had made the transition to working remotely. Respondents said that this newly developed skill at virtual meetings will carry over after the pandemic ends.

Figure 6 shows the tools that companies have recently added.

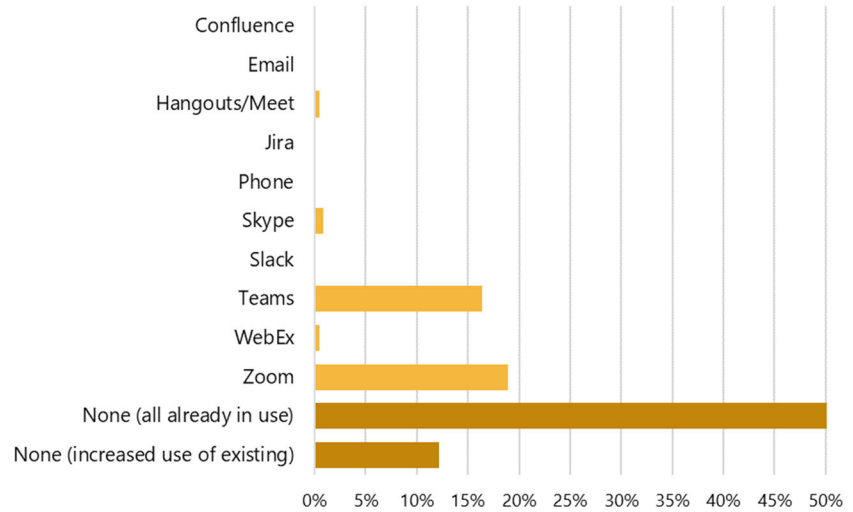


Figure 6 Newly added communication tools.

Teams and Zoom were added approximately equally. Many respondents commented that they already had the tools in place but the tools had not been used often prior to the pandemic. They reported that usage now is “through the roof.”

Frustrations with other people’s remote communication setups

Respondents expressed more frustration with other people’s home setups than they did with their own. Issues included:

- Poor microphone quality
- Poor webcam quality; image not well-framed in webcam
- Dropped connections
- Children and other family members interrupting meetings
- Dogs barking

Respondents also described problems with communication tools:

- Network lag
- People talking over each other (“you go, no you go, no you go”)

Despite these problems, most respondents stated that remote communication was working better than expected or far better than expected.

Increased stakeholder awareness and acceptance of WFH

Respondents said the pandemic had forced managers and other stakeholders to more rapidly accept WFH as a valid work model. It also increased understanding of staff who were already WFH.

Challenges with connections to company networks and other resources

Numerous respondents said their companies’ VPN connections were not able to accommodate the load of the entire company WFH. Issues included dropped connections, slow connections, and company security policies that prevented

remote access to needed resources. Respondents also mentioned challenges working without specialized instruments, lab equipment, test equipment, and other specialized hardware.

However, respondents also said that the pandemic had forced their companies to work out the kinks in the WFH tool chain and that those improvements would persist after the pandemic is over.

Meeting-Specific Communication

Figure 7 shows the tools most commonly used for meetings. The gray bars reflect the details of Figure 5 (most commonly used general communication tools).

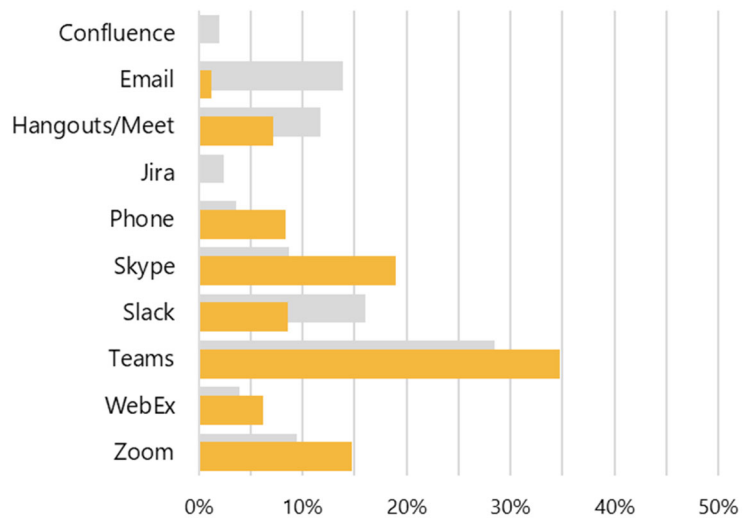


Figure 7 Most commonly used meeting tools.

Teams, Skype, and Zoom were the three most common meeting tools. Slack was tied with personal phone/cell phone/telephone for fourth place.

Communication has become more deliberate and better

Respondents said that WFH had forced several improvements in communication:

- Team members put more effort into their written communications
- Team members put more effort into using their team’s collaboration tools
- Team members have become better at video conferencing
- Meetings are better planned and stay on task more
- Unnecessary meetings have been reduced

Some respondents reported that their teams communicated better using Teams or Slack than they had in the past in-person.

People show up to meetings on time | better meetings

Respondents stated that morning meetings started on time more often because there were fewer delays from traffic, family issues, or transitioning from other meetings.

Change in the scheduling of meetings

Some respondents reported using the practice of starting meetings 5 minutes after the hour and ending “hour-long meetings” 5 minutes before the hour—or alternatively scheduling meetings to last 25, 50, or 80 minutes. These structures allow people to take short breaks between meetings and provide time to sign in to the next meeting.

Other respondents reported designated specific days as “meeting-free days”—for example, no meetings are allowed to be prescheduled for Fridays (though staff can still collaborate remotely as needed).

Complex Communications

Although staff who are WFH have found ways to communicate about day-to-day matters effectively, complex communications have become difficult or ineffective.

Collaboration, brainstorming, and whiteboarding | highly interactive meetings

Numerous respondents said that unstructured or loosely structured conversations were difficult or not effective while WFH. Many referred to difficulties “whiteboarding.” Tools exist for this, but respondents said the tools were not a substitute for in-person collaborative discussions.

Respondents said that specific group-collaboration activities—such as brainstorming, diagramming, product design, architecture, story mapping, and front-end project activities in general—were difficult to do well, even with tool support.

Overall, meetings where simultaneous communication is important have not worked well.

Large group meetings

Large group meetings are more challenging: it is not possible to “read the room” and group interactions and side conversations are very different. Respondents defined “large” as anywhere from 5–20 people.

Newly formed teams

Teams that have not worked together before have difficulty forming remotely. They do not have their roles and working relationships sorted out.

Teams with friction

Teams that already had fractious interactions are having more difficulty with communication than cohesive teams.

Coaching

It's difficult to achieve the level of interaction needed to coach junior staff effectively. It's hard for junior staff to seek help as often as they need it.

Incidental communication

A small but important part of software development is insights that arise from incidental communication. Many respondents said they missed the benefit of conversations at the water cooler, over coffee, or during the lunch break. Because such conversations cannot happen spontaneously while WFH, some said that scheduling them did not have the same effect. People go longer without hearing information related to their jobs, so more information needs to be communicated purposefully.

Social time

Many respondents said that their teams had scheduled coffee breaks, virtual cocktail hours, and other social times and that those had helped with team dynamics.

Figure 8 shows the tools most commonly used for social interactions. Again, the gray bars reflect the details of Figure 5 (general communication tools).

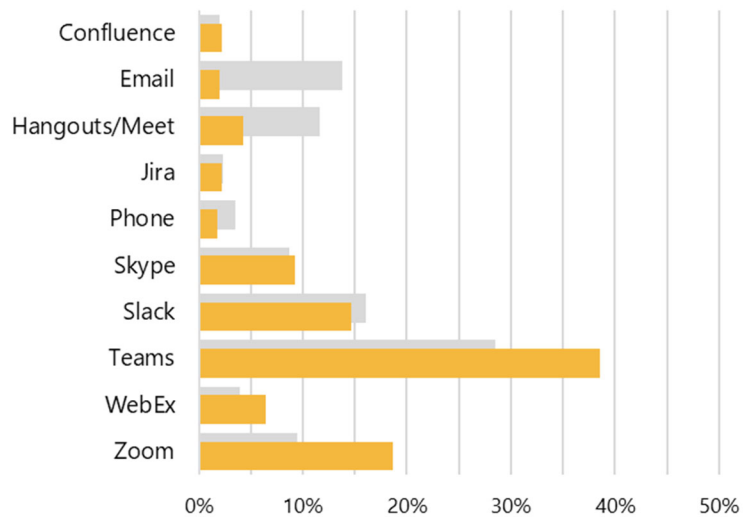


Figure 8 Most commonly used tools for social interactions.

The Personal Experience of WFH

Participants reported numerous personal issues related to WFH, which are detailed below. In general, aspects of WFH that were expected to present challenges did in fact present challenges. However, numerous unexpected benefits offset the challenges to such a degree that most respondents expect to WFH more in the future than in the past.

Challenges

For the most part, respondents reported predictable challenges, such as inadequate home office setups, distractions from other people working in the same home, self-motivation, unclear boundaries between work and home lives, and feelings of isolation.

Challenges with home office setup

Some participants with home office setups reported the following challenges:

- No dedicated workspace (work from kitchen table; must share space with spouse or children)
- Uncomfortable chair or desk; no standing desk
- Insufficient internet bandwidth
- Shared internet bandwidth with multiple other people using the same internet connection for their own work or school
- Unreliable internet (dropped connections)
- Old, slow computer
- Only one computer screen, small screen, no screen separate from laptop
- Different technology at home than at work (e.g., Mac at home, Windows at work)

One participant wrote, "Home offices are non-existent and/or employees are not set up to work from hell well. [sic, home?]"

Challenges with home environment, especially distractions

By far the most common challenge reported in this area was young children who were being home-schooled rather than attending their regular schools. Respondents seemed divided in their overall reactions to WFH depending on whether they had young children at home.

Participants reported other distractions related to working from the same place they live, including:

- Interruptions from roommates, spouse, girlfriend, boyfriend
- Working in same physical space as a roommate/partner/spouse and children
- Online meetings scheduled for same time as roommate/partner/spouse

Some people reported that they were more interrupted by email, online chat, and video meetings while WFH than they would be at their office.

Self-motivation

Some people reported that in the normal office environment they felt energized by being around their coworkers, whereas in a WFH environment they had to find ways to self-motivate.

Respondents recommended keeping to their previous work schedule, dressing for work as they would normally, and designating a specific part of their living space for work to the degree possible.

Separating work and home lives

Numerous respondents described challenges separating work lives and home lives. The most common problem was working too much—allowing work to overshadow personal time. As one respondent wrote, “Not having a clean demarcation of getting in the car in the morning and coming home at night blurs those lines.” Numerous respondents recommended taking regular breaks for physical activity and to go outside.

Feeling isolated

Many respondents said they missed the in-person social interactions with their coworkers and reported feeling lonely and isolated.

Benefits

Many benefits were the flip side of the reported challenges.

Fewer distractions

Many, many respondents described a greater ability to focus without distractions in their home environments. They reported that interruptions, coffee breaks, chit chat with colleagues, and ad hoc requests were greatly reduced. They reported their home environment was more quiet. Some respondents stated that their home environment was less disruptive than their open-floor-plan office. One respondent stated that there were “minutes saved everywhere.”

Many people said they were working longer days because of not commuting. (Commuting is discussed in more detail below.)

For people who did not have small children in the home, the general sense seemed to be that the home distractions were just as they had imagined, but the absence of office-place distractions more than offset distractions at home.

Coding

Many respondents specifically said that coding had improved because of the lack of interruptions.

Integration of work and home lives

As a counterpoint to the challenge of separating work and home lives, many respondents said they experienced less stress because they could attend to family and personal issues when they arose and then extend their work day as needed.

Respondents said that it was especially valuable to be at home and be available to support family during the coronavirus pandemic.

Commute-Related

More respondents commented on the benefits of not commuting than on any other topic. Benefits listed were numerous, and many were unexpected. The expected benefits included:

- Less stress from traffic, missed trains/buses, late trains/buses, hurrying to be at work on time
- More time for both work and home
- Cost savings from gas, train fares, bus fares

Respondents also described numerous unexpected benefits:

Flexibility

Respondents felt they had more flexibility in their work hours because of saving commuting time.

Earlier start time

Respondents are able to start earlier from home than they are after a long commute.

Meetings start on time more often

Respondents stated that morning meetings were no longer delayed due to traffic, late buses, and so on.

Longer work days

Respondents said they liked being able to stay focused on a task without needing to leave work at a specific time to catch a bus or train or to take advantage of a period of lighter traffic. They liked feeling, "free to work longer instead of checking the time every 10 minutes as soon as end of business approaches."

Sleep

Respondents said they could get more sleep because of not commuting.

Higher productivity

Many, many respondents said that, all things considered, their productivity had increased while WFH. Fewer disruptions was most often cited, followed by meetings becoming more purposeful and focused and time-savings related to not commuting.

No Benefits

Some respondents stated that they had not seen any benefits from WFH.

Background Stress From Coronavirus

While many respondents seemed unaffected by the pandemic, some expressed concerns about others' health, family anxiety, more awareness of minute-to-minute news stories because of WFH, cabin fever, and general uncertainty.

In our view, this suggests that the benefits teams and companies are now experiencing from WFH will increase when the WFH does not occur against a backdrop of a global pandemic.

The Team Experience of WFH

As shown in Figure 9, working relationships were most often described as *The Same* to *Slightly More Challenging* for all relationships, including relationships with Scrum Master, Product Owner, Product Managers, Business Partners, and Stakeholders. *The Same* was the most common response, except for relationships with Your Team Members, which were most often described as *Slightly More Challenging* (46.2%).

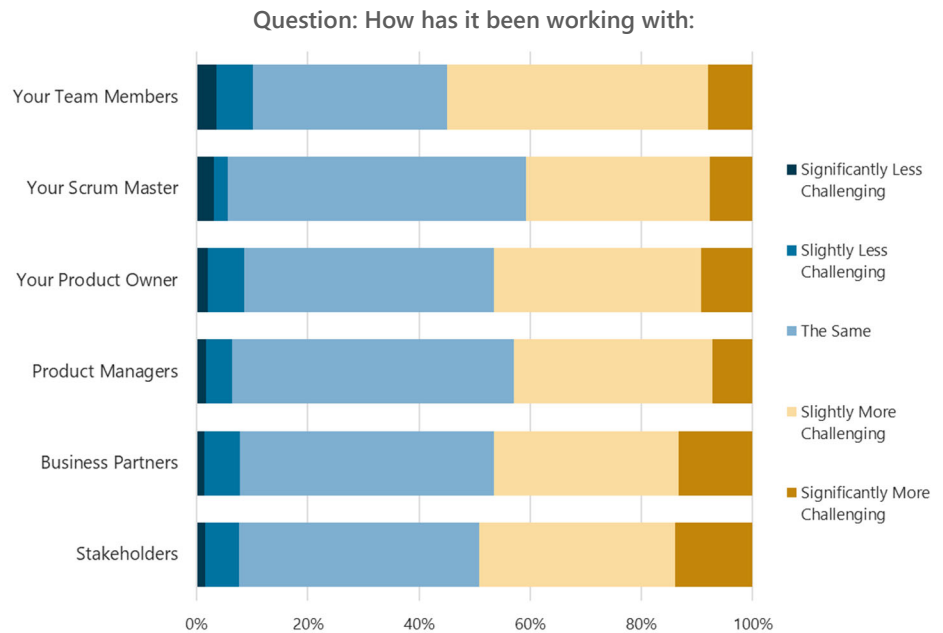


Figure 9 Changes in working relationships.

When *The Same* is removed from the set of responses, it is clear that more respondents found increased challenges than decreased challenges (Figure 10). However, far more characterized the change in relationships as *Slightly More Challenging* than *Significantly More Challenging* for all relationships.

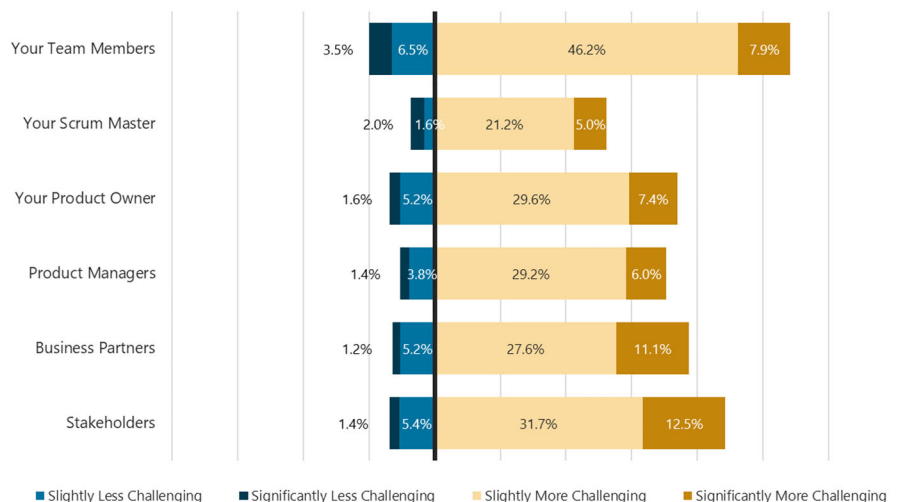


Figure 10 Changes in working relationships with *The Same* removed from responses.

Home Environment and Teamwork

Separating work and home lives | availability

The unclear line between work and home lives does not just affect individual work. Some respondents said colleagues would call before their work day started or after the work day ended. Others said that they did not feel comfortable calling others, because they did not know whether they were busy, unlike in an office where they could see whether a person was busy.

Getting to know teammates by WFH

Respondents also said that they liked being able to see their teammates in their home environments. They liked learning about their family members, pets, culture, decorations, posters, and other personal items.

Collaborative Work

Better to have everyone WFH than a mix

Respondents said that remote work is better when *everyone* is remote—a mix of some in a room together and some remote doesn't work well. Nuances of this issue include:

- Multiple people in a conference room using the same microphone vs. everyone having their own microphone
- Some people using collaboration tools and others collaborating face to face
- Some people communicating by email and others communicating face to face

Respondents who were WFH before the pandemic began were especially positive about the improvement in teamwork with everyone WFH. Respondents used phrases like “leveled the playing field” and “put everyone on the same footing.”

Responsiveness and availability

Respondents described expectations around responsiveness as both positive and negative. Some said WFH made people easier to reach and more available, and some said it made them harder to reach and less available. Some described the expectation of high responsiveness as necessary for WFH effectively. Others described it as undermining the benefit of fewer disruptions in the home environment.

Figure 11 shows the tools used most often for group collaboration, compared to the details in Figure 5 (most commonly used general communication tools).

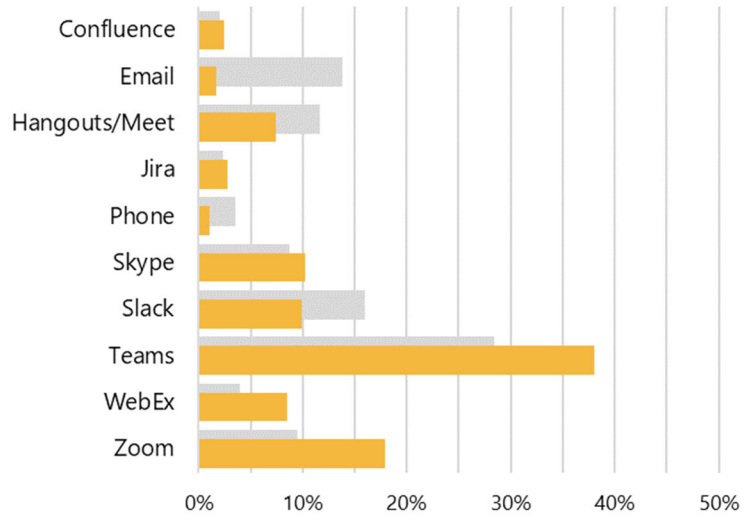


Figure 11 Most commonly used collaboration tools.

Tool usage was effectively tiered, with Teams alone in the top tier; Zoom alone in the second tier; and Hangouts/Meet, Skype, Slack, and WebEx clustered in the third tier.

Increase in Shared Experience

Many respondents stated that the experience of WFH during the coronavirus pandemic had brought their teams closer together. They reported numerous nuances:

- They inquire about one another’s well-being more often; they are connecting on a more human level
- They take more social breaks together
- People from remote locations are on a more equal footing, and everyone has gotten to know everyone else better
- There is a greater sense of supporting one another
- Different people have “risen to the occasion”; they have a different view of the strengths and weaknesses of the team
- They share an interest in the survival of their business
- People are better rested and in better moods because they are not commuting

Respondents reported that the virus has been an equalizing factor.

The Leader Experience of WFH

About one-third of survey respondents were in manager or executive roles. They reported numerous insights into leading effectively while people are WFH.

Perhaps the most significant insight is that leading remotely requires a different skillset than leading in person. Leaders who find themselves leading remotely should invest in developing that skillset.

New Challenges for Leaders in Supporting Teams

Support and encourage communication within the teams

Software teams are mixes of introverts and extroverts. Respondents said that keeping team members communicating required active encouragement.

Be aware of need for increased coordination

In an in-person environment, people will coordinate at the water cooler. While WFH, the manager needs to facilitate more of that coordination to be sure it occurs. This is especially true for coordination *across* teams. Knowledge sharing has become less effective, so it needs to become more deliberate.

Coach staff on the separation of work and personal time

Not everyone self-manages well, so coach staff on the value (and acceptability) of personal down time. Coach team members on the need to respect one another's personal time.

Be visible

The leader cannot be visible by walking around, so make sure to remain visible and accessible in other ways.

Find a substitute for management by walking around

Respondents expressed frustration at not being able to manage by walking around. They said they couldn't tell whether a staff member was interruptible. They couldn't have a casual conversation. Scheduling a time to talk made every conversation seem important, even if it was intended to be casual.

Don't overcrowd your staff's calendars

Some respondents said their managers were scheduling check-ins as many as four times per day. This was described as intrusive and excessive.

Be aware of emotional needs as well as work needs | maintain morale

Keep team members focused with positive outlooks during times of uncertainty. Schedule virtual lunches, happy hours, and so on to encourage social connections.

Be aware of the different needs of different personalities

Some team members prefer WFH. Some prefer working in an office setting. During an unusual period of intensive WFH, team members can have different needs than they would have when working together.

Show your human side

Respondents stated that seeing their bosses in jeans and T-shirts has made them more approachable.

Challenging Communications

Some routine communications become easier when WFH. But just as complex communications within teams become more difficult, so do complex communications for leaders. Respondents listed numerous kinds of communications that are difficult to do remotely:

- Mentoring junior staff
- Onboarding new staff
- Recruiting and hiring
- Working on new, complex issues
- Getting to know your staff at a new company
- Confronting performance issues
- Helping with conflict resolution

Tool Usage

Figure 12 shows the tools that were most often used for company communications (again with the gray bars to compare to tools used for general communication).

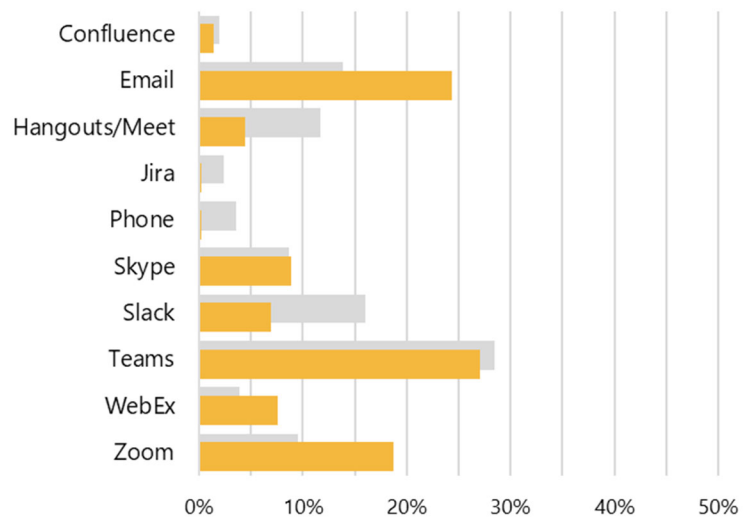


Figure 12 Tools most often used for company communications.

Company communications is the only usage in this survey in which Email was frequently mentioned.

Effect of WFH on Specific Technical Practices

This section addresses the development of software specifically and discusses the effect that WFH has had on detailed technical practices.

Challenges in Scrum Events

For Scrum activities, the overall response was that Scrum activities were *The Same* or *Somewhat More Challenging*: 82.5% combined for Daily Scrum, 89% for Sprint Planning, 77.1% for Sprint Review, 73.9% for Sprint Retrospectives, 76.9% for Backlog Refining. The most common answer in all cases was *The Same*. See Figure 13.

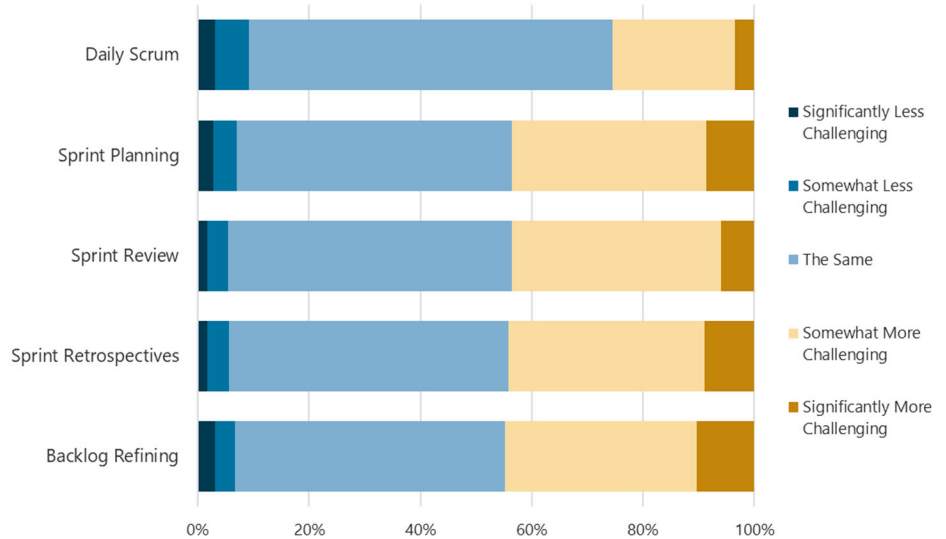


Figure 13 Effect of WFH on Scrum activities.

When *The Same* is removed from the set of responses, it is clear that respondents found the activities at least somewhat more difficult to conduct while WFH (Figure 14).

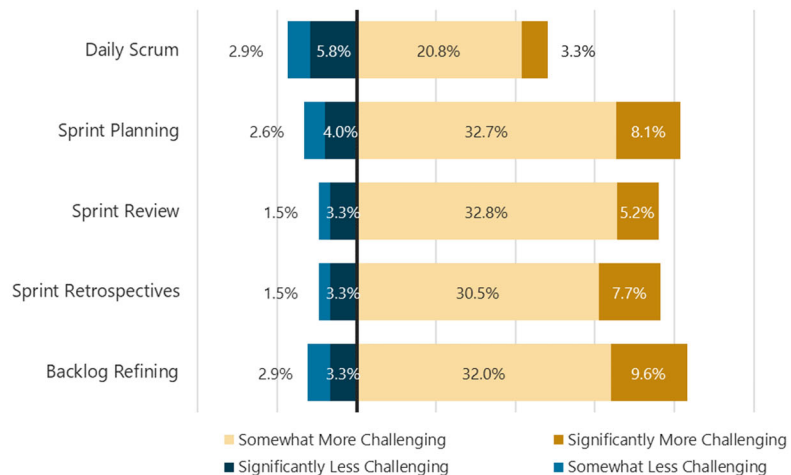


Figure 14 Effect of WFH on Scrum activities with *The Same* removed from the responses.

Daily Scrum was the activity least affected by WFH. The remaining activities were described as being *Somewhat More Challenging* or *Significantly More Challenging* at least 38% of the time. Respondents commented that it was

difficult to see body language and harder to notice issues that were not brought up explicitly.

Daily Scrum

Many respondents said they were conducting Daily Scrum over video tools, and some said they were using Slack. The respondents who mentioned Slack stated that they had found it to be more efficient than holding meetings in person. Many respondents said they had decreased the frequency of the “Daily Scrum” to 2–3 times per week. A few said they had increased frequency to 2–3 times per day.

Some respondents said communication was worse in the Daily Scrum, but some reported it was more organized, stayed on topic better, provided for more balanced participation, and went faster. This seems to be an example of the general pattern that routine communications can be about the same and in some cases improved because of a more deliberate approach to the routine communication.

Pair programming

Although not a Scrum practice per se, several respondents stated that pair programming was more difficult to conduct remotely.

No significant change

A significant number of respondents said there had not been any change in their Daily Scrum, because either part of their team was already remote or their Scrum leader was already remote.

Challenges in Kanban Events

The responses specific to Kanban practices largely echoed the responses for Scrum.

Most respondents described the Daily Kanban as being *The Same*. Continuous Improvement Activities were the most difficult, with 38.4% describing them as *Somewhat More Challenging* or *Significantly More Challenging*. The Queue Replenishment Meeting was in the middle, with 32.2% describing it that way. See Figure 15.

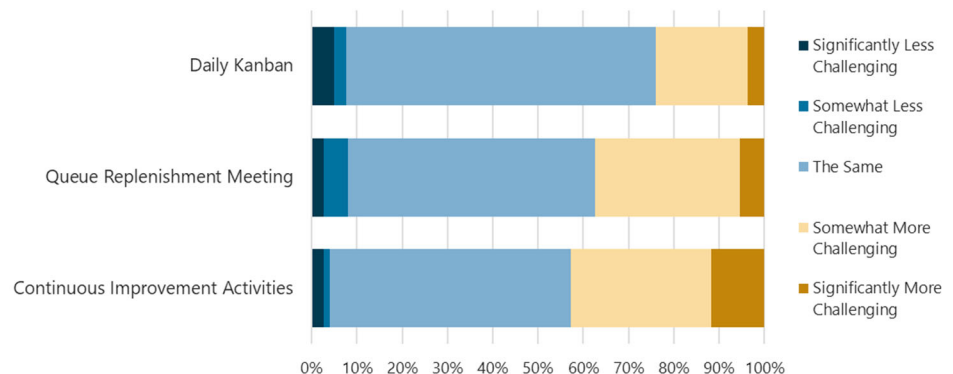


Figure 15 Effect of WFH on Kanban activities.

Use of digital Kanban board

Respondents were mixed in their reactions to use of a digital board. Some felt it was easier for everyone to contribute; some that it was more difficult; and some that it was the same.

No significant change

As with Scrum, a significant number of respondents said there had been no change, primarily because those respondents' teams were already working remotely.

Challenges in SAFe events

Unlike Scrum and Kanban, SAFe was seen as markedly more difficult to do while WFH, as shown by Figure 16. SAFe PI Planning was seen as less challenging by only 8.2% of respondents, while 63.2% found it to be more challenging.

Inspect & Adapt was found to be less challenging by only 2.0%, while 47.0% found it more challenging.

System Demo was found to be less challenging by 4.2% and more challenging by 43.8%; Scrum of Scrums/ART Sync was found to be more challenging by 31.3%, with no respondents finding those activities less challenging; and PO Sync was found to be more challenging by 27.6%, with no respondents finding that activity less challenging.

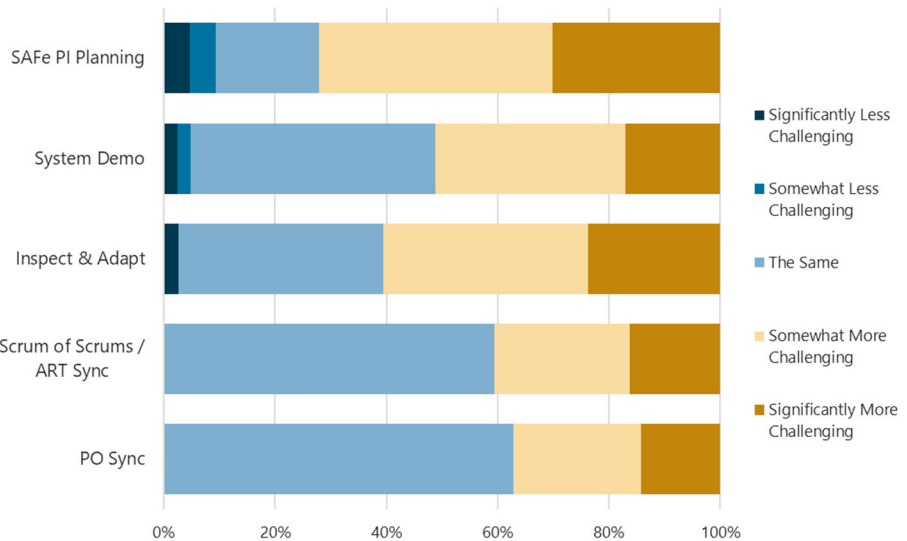


Figure 16 Effect of WFH on SAFe activities.

Scrum/Kanban Tool Usage

Figure 17 shows the most commonly used Scrum/Kanban tools, compared to the general communication tools depicted in Figure 5.

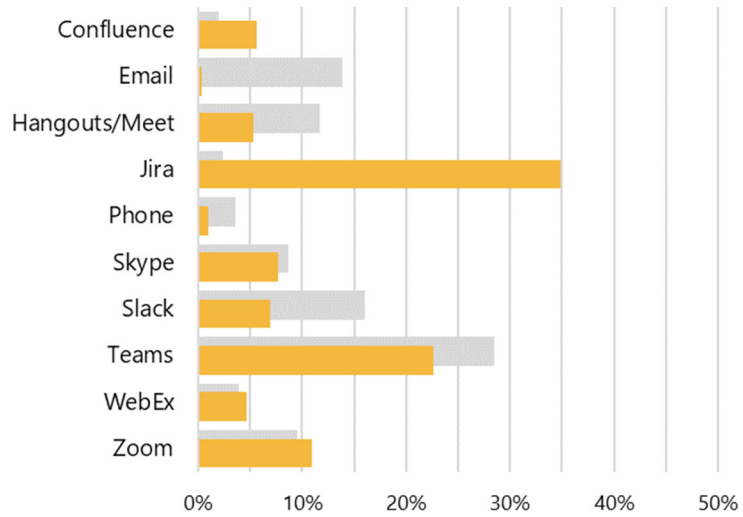


Figure 17 Most commonly used Scrum/Kanban tools.

Summary

Survey respondents described numerous challenges and benefits of WFH because of coronavirus. Most expect they will work from home more often after the pandemic. Several described a view of a “new world” after the pandemic is over, with enhanced remote collaboration skills, less frequent business travel, and reduced need for physical offices. Some predicted increased societal pressure on companies to allow WFH, and others predicted more staff living further away from their offices and more people living in rural areas.

Future speculation aside, respondents also described a new world *now*. They described people being kind and supporting, and they described unexpected staff members rising to the occasion. Many described participating in virtual coffee meetings, happy hours, and team chats to stay connected. One respondent wrote that, “The whole world has become a friendlier, more caring place.” Another wrote, “There is a lot more humanity than we thought.”

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About Construx

Founded by *Code Complete* author, Steve McConnell, we believe that every software team can be successful. We believe that developing the professional skills of companies, teams, and individuals is the best way to achieve more software success. We offer industry-leading, practical career development programs, online and in-person training, and highly targeted consulting.

Learn more about us at
construx.com