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Advances in information and communications technology have enabled organizations to shift traditional work functions away from place or where work is accomplished to how work is accomplished (i.e., task facilitation). With the rise in remote work, there was a need to describe the adoption process by organizations in the United States. Given that the practice of remote work is considered an innovation, this quantitative study was guided by the theory of Diffusion of Innovations and followed a nonexperimental design with a correlational analysis, collecting cross-sectional data from a sample of organizational leaders in the United States (N = 1,259). Results describe where organizations range in the innovation-decision process of remote work adoption and categorize organizations based on innovativeness. This research demonstrates the role of COVID-19 in precipitating organizations' rapid implementation of remote work during a pandemic. Findings hold implications for leaders deciding whether to adopt remote work as a formal workplace practice and can assist them in making informed operational decisions. Findings also provide Extension professionals with insights into responding to the social and economic consequences of the widespread adoption of remote work with relevant, research-based educational programming in their local communities.

Keywords: remote work, adoption, Extension programming, innovation, diffusion, leadership

Introduction

Organizations have traditionally operated in physical work environments since the industrial revolution (Koehler et al., 2013; May et al., 2005). Since then, the work environment of the conventional office shifted away from place - where employees congregate for set hours to work at assigned stations - towards task facilitation (i.e., how work gets done; Blok et al., 2009; Croon et al., 2005; Hill et al., 2003). The concept of remote work first emerged as a solution for lessening traffic congestion and decreasing energy consumption by distributing *work to workers* as opposed to *workers to the work* (Avery & Zabel, 2001). This idea was influenced by Nilles, who coined the terms *telecommuting* and *telework* in 1973 (Joice, 2000; Nilles, 1973). Nilles

proclaimed the value and importance of the concept, which ultimately started the telework movement. His efforts inspired others to challenge the federal government to evaluate the facilitation of federal employees working from home to improve productivity, reduce costs, and conserve energy (Joice, 2000).

By the turn of the 20th century, over 10,000 federal government employees were working remotely. During this time, several studies were published regarding the advantages and challenges of this innovative practice (Kurland & Bailey, 1999; Venkatraman, 1994). Attaining higher productivity levels and supporting employee well-being were the primary advantages of remote work (Choudhury et al., 2019; Pitt-Catsouphes et al., 2007). Organizations instituting formal remote work policies (i.e., plans and procedures) reported productivity increases, reductions in absenteeism and turnover, as well as improved organizational loyalty and performance (Bloom et al., 2015; Choudhury et al., 2019; Gebhart, 2020; Greer & Payne, 2014; Hill et al., 2003; Kelliher & Anderson, 2010; Kurland & Bailey, 1999; Martin, 2012; Martin & MacDonnell, 2012; Martínez-Sánchez et al., 2008; Rogers, 2003). In their meta-analysis of 46 studies, Gajendran and Harrison (2007) associated remote work with greater perceived levels of autonomy, job satisfaction, and increased employee productivity. Employees also associated remote work with lower perceived levels of work-family conflict, stress, and turnover intent. Based on these studies, the disadvantages of remote work were isolation, burnout, lack of team cohesion, lack of employee engagement, micromanagement, and peer envy (Collins, 2005; Gebhart, 2020; Greer & Payne, 2014; Owens, 2017).

Remote work and other associated terms (e.g., telework, flexwork, virtual work, distributed work) all describe work done away from a central workplace, but some terms represent different approaches to the practice. Allen et al. (2015) contributed the following definition to clarify the concept of remote work further:

> A work practice that involves members of an organization substituting a portion of their typical work hours (ranging from a few hours per week to nearly full-time) to work away from a central workplace - typically principally from home - using technology to interact with others as needed to conduct work tasks. (p. 44)

The growth of remote work opportunities in earlier years paled compared to the global shift in response to the COVID-19 pandemic. The pandemic led to a halt on office centricity as many organizations were forced to rapidly implement the practice of remote work (Cabaniss, 2020; Dingel & Neiman, 2020; Guyot & Sawhill, 2020; Kurland & Bailey, 1999; Lutke, 2020). For some organizations, it was a spontaneous decision. However, the transition to remote work provided organizations with a rare opportunity to experience the remote workplace on an involuntary trial basis when most may not have considered this work modality (Clancy, 2020). This experience meant new opportunities for both employers and employees as task facilitation and work-life balance came to the forefront.

Given the potential for remote work, with respect to technological advances and its impact on organizational/operational efficiency, there is a need to investigate and explain the process of remote work adoption by organizations in the United States (Clancy, 2020; Katz & Krueger, 2019; Martínez-Sánchez et al., 2008; Pérez Pérez et al., 2005; Vrchota et al., 2019). Understanding the adoption process of remote work will assist leaders in making more informed decisions regarding how their organization will adopt or reject remote work as a workplace practice. Results will also serve to inform the efforts of Extension professionals in their development of educational programming responsive to the widespread implementation and adoption of remote work in the United States. Utah State University Extension's Rural Online Initiative is one example of an innovative program that provides workforce development training to prepare rural residents for remote jobs and career success in a rapidly changing economy (Gillmor, 2018; Hill et al., 2020; Reese et al., 2018).

Theoretical Framework

Rogers (2003) developed the theory of Diffusion of Innovations (DOI) in the early 1960s to describe a unique category of communication in which messages are focused on new ideas. DOI theory explains the process by which an idea (i.e., an innovative product or practice) is communicated through various channels over time and between members of a social system. This study uses the DOI theory (Rogers, 2003) to describe remote work adoption by organizations in the United States.

Rogers (2003) describes the innovation-decision process as a progressive experience of five stages that takes place over time. As Ryan and Gross (1943) indicated, adoption is not an impulse decision. The process begins with an individual, or a decision-making group, first becoming aware of an innovation (stage 1: knowledge), forming an opinion of it (stage 2: persuasion), and then deciding whether to adopt or reject it (stage 3: decision). Adoption is followed by applying the innovation in practice (stage 4: implementation) and later resolving whether to continue using the innovation or not (stage 5: confirmation). The entire innovation-decision process comprises a sequence of choices and actions in which potential adopters make judgments regarding whether to put an innovation into practice amid some uncertainty.

Adoption by individuals or organizations does not happen simultaneously. Adoption across a system occurs chronologically, placing adopters into categories to be explained over time—specifically when they first begin utilizing an innovation (Rogers, 2003). The five adopter categories are innovators, early adopters, early majority, late majority, and laggards. Rogers (2003) developed the S-shaped curve of adoption as one distinct method of adopter categorization. This type of S-shaped curve is common because of the exponential power of peer networks, where 10% to 20% of adoption happens over a short period of time when diffusion steeply rises. Rogers (2003) also expounded upon adopter characteristics in greater detail, generalizing earlier adopters (innovators, early adopters, and early majority) and later adopters

(late majority and laggards). Rogers resolved the major differences between these divisions by socioeconomic characteristics and personality variables which tend to be associated with innovativeness (Rogers & Shoemaker, 1971). In this study, organizations within the United States will be categorized based on their leader's individual levels of innovativeness. As such, primary characteristics of each adopter category will be outlined under socioeconomic status.

Organizational leaders categorized as innovators would have adopted the practice of remote work prior to or during the year 1999, given the legislation requiring all federal agencies to institute remote work policies (U.S. Office of Personnel Management, n.d.). To engage in the practice of remote work prior to 1999, a leader must first be aware of the practice and "be able to cope with a high degree of uncertainty" (Rogers, 2003, p. 282). Only a very small percentage (2.5%) of organizational leaders would comprise this category, as it would have been rare for anyone to consider distributed operations before the technological infrastructure (e.g., internet and ICTs) was in place to allow for communication and productive work to occur.

Organizational leaders categorized as early adopters would have adopted the practice of remote work between the years 2000 to 2004. The rationale for this categorization dates back to the U.S. Department of Transportation Appropriations Act of 2000, which required all federal agencies to institute remote work policies (U.S. Office of Personnel Management, n.d.). By 2004, most federal agencies had policies to permit employees to work remotely as long as the practice did not inhibit their performance. Because early adopters are slightly ahead of those in average adopter categories, they can be considered exemplary members of a social system and "help to trigger the critical mass when they adopt an innovation" (Rogers, 2003, p. 283).

Organizational leaders categorized in the early majority would have adopted the practice of remote work between the years 2005 to 2014. The rationale for this categorization aligns with the diffusion of wireless router connectivity to the internet and broadband access across the United States, providing remote employees with the infrastructure to perform their work from anywhere (Campbell & Ling, 2020; Horrigan, 2008; Perrin & Duggan, 2015). Faster internet speeds also improved the quality of video conference technologies such as Skype and GoToMeeting, leading to widespread adoption by organizations as well as consumers (Rao, 2011). To engage in the practice of remote work between the years 2005 to 2014, an organizational leader would have relied on the documented experience of an early adopter to reduce uncertainty before making use of the innovative practice (Rogers, 2003).

Organizational leaders categorized in the late majority would have adopted the practice of remote work between the years 2015 to 2019. The rationale for this categorization is founded in the widely accepted practice of remote work, due in part to an even larger portion of the United States workforce (70%) that works remotely a minimum of one day per week (International Workplace Group, 2019). As remote workers regularly use video conferencing software, Zoom entered the market in 2017 and quickly reported a 500% increase in users, reaching over 50,000

in just two years (Walia, 2019). To engage in the practice of remote work between the years 2015 to 2019, an organization leader would have previously doubted any relative advantages or have recently formed a new organization (Audretsch, 2019).

Organizational leaders categorized as laggards would have been forced to adopt the practice of remote work during the year 2020 or later. The rationale behind this categorization revolves around the COVID-19 global pandemic, which resulted in organizations practicing remote work to comply with social distancing guidelines by allowing employees to work from home in an effort to circumvent the spread of the virus (Dingel & Neiman, 2020). To first engage in the practice of remote work during the year 2020 or later, organizational leaders would have relied heavily on traditional workplace practices.

Purpose and Objectives

The purpose of this study was to describe the adoption process of remote work by organizations in the United States and the effect of COVID-19 on the practice. Guided by DOI theory, objectives were to (a) determine where organizations range in the innovation-decision process of remote work adoption, (b) categorize organizations' level of innovativeness with respect to remote work adoption, and (c) describe the extent to which organizations implemented remote work in response to the COVID-19 pandemic, explaining their favorability towards the practice.

Methods

This study followed a nonexperimental design and gathered cross-sectional data from a convenience sample of organizational leaders. The target population was organizational leaders in the United States with influence in the hiring process of their organizations. The sample size consisted of 1,259 organizational leaders (n = 1,259). A proportionate stratified convenience sampling approach was employed to improve the sample's representation relative to sector employment in the United States (Ary et al., 2013). The most recent employment sector data from the U.S. Bureau of Labor Statistics (2020a), available as of September 1, 2020, reported the proportion of public sector (e.g., government, education) employment at 14% (n = 140), private sector (e.g., for-profit business) at 76% (n = 760), and not-for-profit (e.g., arts, social advocacy, health services, education, etc.) at 10% (n = 100).

The convenience sample was stratified to ensure that one employment sector was neither over- nor underrepresented nor had disproportionate weight in the sample (Cooper, 2017). While this method allowed the sample to match the population based on pre-defined population parameters, it did not change the limitations of using a convenience sample (e.g., sampling bias and low external validity). A nonprobability convenience sample was used to select participants from opt-in panels provided by Centiment, a market research company. The questionnaire was administered to the sample via an online survey by Centiment from November 24 to December 5, 2020. Participants of Centiment's targeted opt-in panels were granted access to complete the

full survey based on responses to qualifying questions regarding whether they (a) manage employees and (b) influence their organization's hiring process.

The questionnaire was reviewed by a panel of experts with proficiency in Extension education, evaluation, questionnaire design, and DOI theory to verify construct validity of innovation attributes (Ary et al., 2013). The expert panel consisted of six doctoral-level researchers with experience in planned change theories from three land grant universities in the United States. Expert panelists were invited to review the questionnaire over a period of two weeks, and all completed their review in this time frame. The instrument's item design was informed by the guidelines for writing closed-ended questions and designing web and mobile questionnaires detailed in the Tailored Design Method (Dillman et al., 2014) to verify face validity. For Likert-scale items, response options were based on a five-point scale and evenly spaced with a clear mid-point. Additionally, items were grouped by constructs to avoid disparate comparisons across distinct constructs. These actions established consistency in item flow and increased the face validity of the instrument (Dillman et al., 2014).

Guided by the DOI, the innovation-decision process with respect to remote work was operationalized through seven scenarios in a single question designed to ascertain an organization's current stage in the process. Two knowledge stage scenarios were designed to frame an organization's familiarity with the concept of remote work. The persuasion stage scenario was designed to frame an organization's exploration into the concept of remote work and opinions (i.e., perceived attributes) formed towards the practice, either favorable or unfavorable. The two decision stage scenarios (e.g., adopt or reject) were designed to frame an organization's engagement in early activities that lead to remote work adoption or rejection. The implementation stage scenario was designed to frame an organization's practice of remote work after a decision was made to adopt the concept. Finally, the confirmation stage scenario was designed to frame an organization's internal evaluation of implementing remote work and whether to continue offering the alternative workplace arrangement to employees.

Organizational leaders were asked to select one of the following statements that best reflected their organization's current position regarding remote work: (1) my organization has no knowledge regarding remote work, (2) my organization is aware of remote work and understands how it functions, (3) my organization explored the advantages and disadvantages of remote work and has formed opinions towards the practice, (4) my organization has adopted remote work, (5) my organization has rejected remote work, (6) my organization currently allows employees to work remotely, and (7) remote work is an established part of my organization's culture. Respondents' answer to this question reflects the organizations' position within the innovation-decision process (Celik et al., 2014). Responses were coded as follows: 1 = knowledge, 2 = persuasion, 3 = decision (accept or reject), 4 = implementation, and 5 = confirmation.

Organizational characteristics were captured based on sector, industry, years in operation, annual budget, number of employees, location of headquarters, number of locations operated, and extent of international operations. Survey questions were modeled after similar studies examining how organizational characteristics related to adoption of innovations (Allen et al., 2015; Lu et al., 2019; Seo & Vu, 2020). The U.S. Bureau of Labor Statistics' (2020b) report outlining the North American Industry Classification System (NAICS) code order informed the list of industries. Survey participation quotas were established before survey administration so the sample (n = 1,259) would reflect the actual sectors and industries comprising the United States' economy (U.S. Bureau of Labor Statistics, 2020b). Accordingly, 76% (n = 952) of organizations were from the private sector, with 16% (n = 194) from the public sector, and 8% (n = 100) from the not-for-profit sector. Overall, organizations were in operation for 10 years or less (34%, n = 411) and had an annual budget between $1,000,000 to $4,999,999 (34%, n = 408) with 100 to 499 employees (24%, n = 293). Organizations' headquarters were in the Northeast region (32%, n = 378) of the United States, with 31% (n = 372) of organizations operating in two to 10 states and 32% (n = 379) comprising two to 10 branches (i.e., offices, sites). Concerning operations outside the United States, most organizations (55%, n = 661) reported international operations (Table 1).

Table 1. Organizations by Characteristics

Characteristics	*n*	%
Sector		
Public	194	16
Private	952	76
Not-for-profit	100	8
Years in Operation		
Under 10	411	34
11 to 20	360	30
21 to 30	150	13
31 to 40	73	6
41 to 50	66	6
Over 50	139	12
Annual Budget		
$0 to $999,999	283	24
$1,000,000 to $4,999,999	408	34
$5,000,000 to $9,999,999	94	8
$10,000,000 to $49,999,999	174	15
$50,000,000 to $99,999,999	56	5
$100,000,000 to $999,999,999	114	9
Over $1,000,000,000	61	5

Characteristics	*n*	%
Employees		
Under 100	236	20
100 to 499	293	24
500 to 999	270	23
1,000 to 4,999	222	18
5,000 to 9,999	95	8
Over 10,000	83	7
Location of Headquarters		
Midwest	208	17
Northeast	378	32
Southeast	299	25
Southwest	93	8
West	221	18
States in Operation		
Only 1	305	25
2 to 10	372	31
11 to 20	177	15
21 to 30	110	9
31 to 40	69	6
41 to 50	147	12
I do not know	19	2
Branches in Operation		
Only 1	209	18
2 to 20	578	49
21 to 40	209	18
Over 40	176	15
International Operations		
Yes	661	55
No	538	45

All objectives used descriptive statistics to (a) determine where organizations range in the innovation-decision process of remote work adoption, (b) categorize organizations' level of innovativeness (i.e., adopter categories), and (c) explain the extent to which organizations implemented remote work in response to COVID-19 and their favorability towards it. All objectives also used Pearson's chi-square test with Cramer's V for effect size to determine whether statistically significant relationships existed between variables. Cramer's V and adjusted

residuals were considered suitable for measuring these associations' strengths. A Cramer's V value between 0 to .3 was considered weak, .3 to .7 medium, and .7 or higher strong (Johnson & Christensen, 2017).

Results

Objective 1: Determine where organizations range in the innovation-decision process of remote work adoption

While most organizations reported already having remote employees (91%, $n = 933$), the divide between non-adoption and adoption stages in the innovation-decision process was evenly split (Table 2). This inconsistency could be explained by the forced implementation of remote work in response to the COVID-19 pandemic. Given these circumstances, leaders could report being in a non-adoption stage (e.g., knowledge) within the innovation-decision process despite having remote employees in their organization.

In Table 2, results indicated that 35% ($n = 424$) of organizations were in the knowledge stage of the innovation-decision process. Of leaders in this stage, 15% ($n = 173$) reported that their organizations had no knowledge regarding remote work, while 20% ($n = 251$) were aware of the practice and understood how it functioned. For the persuasion stage, 13% ($n = 154$) of leaders explored the advantages and disadvantages of remote work and formed opinions toward the practice. Of organizations in the decision stage (19%, $n = 222$), only 2% ($n = 28$) rejected remote work while 17% ($n = 194$) adopted the practice. Moreover, 22% ($n = 269$) of organizations in the implementation stage reported allowing employees to work remotely, with 11% ($n = 127$) in the confirmation stage indicating that remote work was an established part of their workplace culture.

Table 2. Organizations' Stage in the Innovation-Decision Process by Classification

Stage	Classification	*n*	%	Cum. %
Knowledge	Non-adoption	424	35	
Persuasion	Non-adoption	154	13	
Decision - Reject	Non-adoption	28	2	50
Decision - Adopt	Adoption	194	17	
Implementation	Adoption	269	22	
Confirmation	Adoption	127	11	50

A Pearson chi-square test of association was used to determine whether a relationship existed between the economic sector and stages of the innovation-decision process. Results in Table 3 revealed a statistically significant relationship between economic sector and stages of the innovation-decision process ($\chi^2 = 23.39$, $p = .003$). The effect size was categorized as weak based on Cramer's V ($\phi_c = .10$). Most organizations across all sectors were in the early stages of

the innovation-decision process (Table 3). Most private (37%, n = 341) and public sector (33%, n = 61) organizations reported being in the knowledge stage. In comparison, the not-for-profit sector (31%, n = 30) reported being farther along the process in the decision stage. Although public sector organizations (17%, n = 31) made up the highest relative segment of the persuasion stage, not-for-profit sector organizations (30%, n = 29) reported the highest proportion of organizations in the implementation stage. Interestingly, while the confirmation stage comprised the lowest number of total organizations, the private sector accounted for 12% (n = 105).

Results of the Pearson chi-square test in Table 3 found statistically significant relationships between organizations' years of operation and stages of the innovation-decision process (χ^2 = 65.67, $p < .001$), organizations' annual budget and stages of the innovation-decision process (χ^2 = 104.27, $p < .001$), and the number of employees within an organization and stages of the innovation-decision process (χ^2 = 51.00, $p < .001$). The effect size for each test was categorized as weak based on Cramer's V ($\phi_c \leq .15$).

As shown in Table 3, descriptive frequencies demonstrate older organizations were farther along in the innovation-decision process than younger organizations. For organizations in operation for 10 years or less, only 24% (n = 100) were in the stages of implementation and confirmation, while organizations with over 50 years in operation were 39% (n = 54) in these later stages of the adoption process. In addition, organizations with larger budgets were farther along in the innovation-decision process than organizations with smaller budgets (Table 3). For organizations with annual budgets over $1 billion, 46% ($n$ = 27) were in the stages of implementation and confirmation, while only 18% (n = 50) of organizations with less than $1 million were in the same stages. Finally, organizations with more employees were farther along in the innovation-decision process than organizations with fewer employees (Table 3). For organizations with under 100 employees, 76% (n = 180) were in the early stages of the innovation-decision process (i.e., knowledge, persuasion, decision), while organizations with over 10,000 employees had 44% (n = 36) in the later stages (i.e., implementation, confirmation).

Results of a Pearson chi-square test indicated that the relationship between international organizations and the stages of the innovation-decision process was statistically significant (χ^2 = 42.04, $p < .001$). The effect size was categorized as weak based on Cramer's V ($\phi_c = .19$). The descriptive frequencies in Table 3 show that those operating internationally were farther along in the innovation-decision process of remote work adoption than those operating only in the United States. Results of three other Pearson chi-square tests found no significant relationships with stages of the innovation-decision process of remote work adoption, the number of branches organizations operate, the region where an organization's headquarters were located, and the number of states in which organizations operate.

Table 3. Organizations' Stage in the Innovation-Decision Process by Characteristics

	K (*n* = 424)	**P (*n* = 154)**	**D (*n* = 222)**	**I (*n* = 269)**	**C (*n* = 127)**
	% (AR)	**% (AR)**	**% (AR)**	**% (AR)**	**% (AR)**
Sector					
Public	33 (-.7)	17 (1.8)	18 (-.4)	24 (.5)	8 (-1.2)
Private	**37 (2.3)**	12 (-.8)	18 (-1.8)	21 (-1.6)	12 (1.7)
Not-for-profit	**23 (-2.7)**	9 (-1.1)	**31 (3.3)**	30 (1.8)	7 (-1.1)
Years in Operation					
Under 10	**44 (4.2)**	15 (1.9)	17 (-1.1)	**17 (-3.2)**	**7 (-2.7)**
11 to 20	38 (1.3)	13 (.0)	16 (-1.7)	21 (-.7)	12 (1.2)
21 to 30	**23 (-3.5)**	13 (-.1)	18 (.0)	**30 (2.4)**	**16 (2.3)**
31 to 40	36 (.0)	12 (-.1)	14 (-1.1)	27 (1.0)	11 (.1)
41 to 50	25 (-1.7)	8 (-1.3)	**29 (2.2)**	27 (1.0)	11 (.0)
Over 50	**23 (-3.2)**	9 (-1.6)	**29 (3.3)**	**29 (1.9)**	10 (-.2)
Annual Budget					
$0 to $999,999	**51 (6.2)**	14 (1.1)	17 (-1.0)	**13 (-4.3)**	**5 (-3.7)**
$1,000,000 to $4,999,999	37 (.9)	13 (.3)	18 (-.4)	21 (-1.0)	11 (.1)
$5,000,000 to $9,999,999	36 (.1)	10 (-1.0)	19 (.1)	29 (1.5)	6 (-1.3)
$10,000,000 to $49,999,999	**25 (-3.2)**	11 (-.6)	21 (.8)	**30 (2.6)**	13 (1.1)
$50,000,000 to $99,999,999	27 (-1.4)	9 (-.9)	**29 (2.0)**	30 (1.4)	5 (-1.3)
$100,000,000 to $999,999,999	**15 (-4.8)**	13 (.1)	20 (.4)	28 (1.5)	**24 (4.9)**
Over $1,000,000,000	28 (-1.2)	13 (.1)	13 (-1.1)	29 (1.1)	17 (1.6)
Employees					
Under 100	**43 (2.6)**	11 (-.7)	22 (1.5)	**15 (-3.1)**	9 (-1.0)
100 to 499	39 (1.3)	11 (-.9)	19 (.0)	21 (-.6)	10 (-.2)
500 to 999	37 (.8)	**19 (3.1)**	**13 (-2.7)**	23 (.4)	8 (-1.7)
1,000 to 4,999	**26 (-3.3)**	12 (-.3)	22 (1.7)	25 (.9)	**15 (2.1)**
5,000 to 9,999	31 (-.7)	9 (-1.3)	16 (-.7)	**33 (2.5)**	11 (.0)
Over 10,000	27 (-1.8)	10 (-.6)	19 (.2)	28 (1.2)	16 (1.5)
International Operations					
Yes	**40 (4.0)**	13(.5)	**13 (-5.9)**	22 (-.8)	12 (1.7)
No	**29 (-4.0)**	12 (-.5)	**26 (5.9)**	24 (.8)	9 (-1.7)

Note. K: *Knowledge*, P: *Persuasion*, D: *Decision*, I: *Implementation*, C: *Confirmation*, AR: *Adjusted Residual.* To show where percentages vary from expectation, cells with AR greater or less than +/- 1.96 are in bold.

Objective 2: Categorize organizations' level of innovativeness with respect to remote work adoption

Table 4 shows the descriptive frequencies of organizations' adoption of remote work over time. Organizations categorized as innovators (i.e., venturesome) which adopted remote work in 1999 or earlier consisted of only 7% (n = 62) of organizations. The largest adopter category was the late majority (i.e., skeptical), which adopted remote work between 2015 to 2019 and consisted of 38% (n = 355) of organizations in the sample.

Table 4. Organizations' Adopter Category Frequency Statistics Over Time

Adopter Category	Time	*n*	%
Innovators	1999 or earlier	62	7
Early adopters	Between 2000 to 2004	86	9
Early majority	Between 2005 to 2014	217	23
Late majority	Between 2015 to 2019	355	38
Laggards	2020 or later	212	23

Results of a Pearson chi-square test in Table 5 revealed a statistically significant relationship between the economic sector and adopter categories (χ^2 = 44.78, p < .001). The effect size was categorized as weak based on Cramer's V (ϕ_c = .16). Many organizations across all sectors were later adopters (i.e., late majority, laggards). While private sector (41%, n = 295) organizations were categorized in the late majority, public (32%, n = 46) and not-for-profit sector (43%, n = 29) organizations were categorized as laggards. However, not-for-profit organizations (15%, n = 10) also comprised the largest sector in the innovators category.

Results of Pearson chi-square tests found statistically significant relationships between adopter categories and organizations' years of operation and adopter categories (χ^2 = 66.58, p < .001), the number of employees an organization had (χ^2 = 40.91, p = .004), the location of organizations' headquarters (χ^2 = 32.16, p = .010), the number of states where organizations operated (χ^2 = 130.79, p < .001), the number of branches organizations operated (χ^2 = 49.90, p < .001), and whether organizations operated internationally (χ^2 = 67.49, p < .001). The effect size for each test was categorized as weak based on Cramer's V ($\phi_c \leq .27$).

Descriptive frequencies in Table 5 indicated that older organizations were categorized as earlier adopters in relation to younger organizations. In addition, the late majority and laggards categories were the most prevalent across all ranges of years of operation. In addition, organizations with fewer employees were categorized as later adopters (e.g., late majority, laggards) compared to organizations with more employees. Organizations with under 100 employees comprised the largest category of laggards (33%, n = 47), while those with over 10,000 employees made up the largest category of innovators (17%, n = 11). The descriptive frequencies also showed that organizations headquartered in the Northeast were the smallest

category of laggards (16%, *n* = 49), with the Southwest being the largest (30%, *n* = 22). The Southwest also had the largest category of innovators (10%, *n* = 7), while the West had the lowest concentration of earlier adopters (i.e., innovators, early majority) of all the regions (10%, *n* = 19).

Descriptive frequencies also highlighted that organizations operating in fewer states were categorized as later adopters more than organizations operating in many states. Organizations operating in only one state comprised the largest category of laggards (46%, *n* = 99), while organizations operating in 41 to 50 states comprised the largest category of innovators (13%, *n* = 14). Organizations operating fewer branches were generally categorized as later adopters (i.e., late majority, laggards) more often than organizations operating many branches. Organizations operating over 40 branches comprised the largest category of innovators (9%, *n* = 13), while those operating only one branch made up the largest category of laggards (42%, *n* = 55). Finally, results showed organizations operating internationally were categorized as earlier adopters more than those that did not operate internationally. Moreover, organizations without international operations had more than twice the number categorized as laggards (34%, *n* = 135) compared to organizations that did (15%, *n* = 77). No significant association was found between organizations' annual budgets and adopter categories based on Pearson's Chi-square test.

Table 5. Organizations' Adopter Categories by Characteristics

	I (*n* = 62)	**EA (*n* = 86)**	**EM (*n* = 217)**	**LM (*n* = 355)**	**L (*n* = 212)**
	% (AR)	**% (AR)**	**% (AR)**	**% (AR)**	**% (AR)**
Sector					
Public	9 (1.2)	8 (-.4)	22 (-.4)	**29 (-2.5)**	**32 (2.8)**
Private	**5 (-2.8)**	10 (1.0)	**25 (2.0)**	**41 (3.4)**	**19 (-4.9)**
Not-for-profit	**15 (2.8)**	6 (-1.0)	**10 (-2.6)**	**26 (-2.0)**	**43 (4.1)**
Years in Operation					
Under 10	**3 (-3.4)**	8 (-1.0)	25 (1.0)	**44 (2.5)**	20 (-1.2)
11 to 20	5 (-.7)	12 (1.7)	26 (1.6)	40 (.6)	**17 (-3.0)**
21 to 30	9 (1.0)	7 (-.8)	22 (-.3)	36 (-.5)	26 (.8)
31 to 40	9 (.7)	12 (.9)	15 (-1.6)	44 (.9)	20 (-.5)
41 to 50	**15 (2.6)**	4 (-1.4)	21 (-.4)	27 (-1.7)	33 (1.8)
Over 50	**12 (2.6)**	10 (.2)	**15 (-2.2)**	**23 (-3.4)**	**40 (4.5)**
Employees					
Under 100	6 (-.5)	8 (-.6)	19 (-1.3)	34 (-1.1)	**33 (3.3)**
100 to 499	7 (.3)	8 (-.7)	23 (.0)	38 (-.2)	24 (.6)
500 to 999	6 (-.3)	**14 (2.7)**	27 (1.8)	34 (-1.5)	19 (-1.8)
1,000 to 4,999	5 (-.9)	8 (-.8)	24 (.2)	**45 (2.3)**	18 (-1.8)

	I (*n* = 62)	EA (*n* = 86)	EM (*n* = 217)	LM (*n* = 355)	L (*n* = 212)
	% (AR)	**% (AR)**	**% (AR)**	**% (AR)**	**% (AR)**
5,000 to 9,999	4 (-1.1)	7 (-.6)	26 (.5)	40 (.4)	23 (.1)
Over 10,000	**17 (3.5)**	8 (-.4)	**13 (-2.1)**	39 (.2)	23 (.1)
Location of Headquarters					
Midwest	8 (.8)	7 (-1.1)	21 (-.7)	36 (-.6)	28 (1.8)
Northeast	7 (-.1)	9 (-.1)	**28 (2.7)**	40 (.7)	**16 (-3.5)**
Southeast	6 (-.2)	12 (1.8)	**18 (-2.2)**	40 (.5)	24 (.5)
Southwest	10 (1.0)	15 (1.7)	18 (-.9)	**27 (-2.0)**	30 (1.5)
West	5 (-1.1)	**5 (-2.0)**	25 (.5)	40 (.6)	25 (.9)
States in Operation					
Only 1	8 (.8)	**5 (-2.4)**	**13 (-4.2)**	**28 (-3.3)**	**46 (9.3)**
2 to 10	5 (-1.8)	10 (.4)	26 (1.9)	**44 (2.5)**	**15 (-4.0)**
11 to 20	6 (-.4)	7 (-.9)	23 (.0)	**48 (2.6)**	**16 (-2.1)**
21 to 30	6 (-.1)	**19 (3.5)**	**33 (2.3)**	**28 (-2.0)**	**14 (-2.2)**
31 to 40	2 (-1.4)	10 (.1)	32 (1.6)	45 (1.1)	**11 (-2.0)**
41 to 50	**13 (2.6)**	9 (.2)	22 (-.3)	36 (-.6)	20 (-.8)
I do not know	19 (1.5)	9 (.0)	18 (-.4)	18 (-1.4)	36 (1.1)
Branches in Operation					
Only 1	8 (.6)	8 (-.4)	**13 (-3.1)**	**29 (-2.4)**	**42 (5.8)**
2 to 20	6 (-.3)	10 (.6)	25 (1.2)	41 (1.5)	**18 (-3.2)**
21 to 40	4 (-1.4)	12 (1.5)	29 (1.9)	37 (-.4)	18 (-1.7)
Over 40	9 (1.3)	**5 (-2.1)**	21 (-.8)	41 (.7)	24 (.6)
International Operations					
Yes	7 (-.1)	**12 (3.5)**	**29 (5.1)**	37 (-.6)	**15 (-6.8)**
No	6 (.1)	**6 (-3.5)**	**15 (-5.1)**	39 (.6)	**34 (6.8)**

Note. I: *Innovators*, EA: *Early Adopters*, EM: *Early Majority*, LM: *Late Majority*, L: *Laggards*, AR: *Adjusted Residual.* To aid in interpretability, cells with AR greater or less than +/- 1.96 are bold to show where percentages vary from expectation.

Objective 3: Describe the extent to which organizations have implemented remote work in response to the COVID-19 pandemic and explain their favorability towards the practice

Based on the number of employees working remotely before, in response to, and after COVID-19, Table 6 shows prior to the pandemic, 24% (*n* = 281) of organizations reported under 10% of employees working remotely, and only 4% (*n* = 52) of organizations had over 90% of remote employees. However, in response to COVID-19, about 13% (*n* = 152) of organizations reported

having over 90% of employees working remotely, and those reporting under 10% dropped to 9% (n = 102). After COVID-19, organizations estimated an increased number of employees would continue to work remotely. The number of organizations with over 50% of employees working remotely was 34% (n = 407) prior to the pandemic; however, organizations estimated this portion to increase by 10% to 44% (n = 502; Table 6).

Table 6. Frequency Percentages of Employees Working Remotely

% of Employees working remotely	**Before COVID-19 (n = 1,156)**	**During COVID-19 (n = 1,158)**	**After COVID-19* (n = 1,130)**
	%	**%**	**%**
Under 10%	24	9	14
10% to 19%	8	6	7
20% to 29%	12	7	10
30% to 39%	11	8	14
40% to 49%	10	10	10
50% to 59%	10	13	13
60% to 69%	7	10	10
70% to 79%	7	12	9
80% to 89%	6	12	7
Over 90%	4	13	5
Mean (SD)	4.38 (2.83)[a]	6.08 (2.81)[b]	5.04 (2.69)[c]

Note. "I don't know" responses were coded as missing. Post-hoc tests: a ≠ b ≠ c
*"After COVID-19" refers to whether organizational leaders anticipated continuing to work remotely after the pandemic.

Results of a repeated measures ANOVA indicated statistically significant differences in remote work practices before, during, and after COVID-19 (Greenhouse-Geisser = 215.50, $p < .001$). A paired sample t-test was conducted post-hoc, which found statistical significance in organizations' practice of remote work before and during COVID-19 (t = -18.93, $p < .001$), before and after COVID-19 (t = -8.42, $p < .001$), and during and after COVID-19 (t = 13.82, $p < .001$). Therefore, in response to COVID-19, there was a statistically significant increase in the practice of remote work followed by an anticipated statistically significant decrease after COVID-19. This resulted in a statistically significant increase in organizations' overall practice of remote work before and after COVID-19.

As organizational leaders implemented remote work in response to COVID-19, the majority (71%, n = 820) rated the experience as very or somewhat favorable (Table 7).

Table 7. Frequency Statistics of Favorability Toward Remote Work After COVID-19

Favorability Level	*n*	%
Very favorable	412	36
Somewhat favorable	408	35
Indifferent	141	12
Somewhat unfavorable	111	9
Very unfavorable	106	8

A Pearson chi-square test found a statistically significant relationship between the practice of remote work and adopter categories ($\chi^2 = 50.74$, $p < .001$). The effect size was categorized as weak based on Cramer's V ($\phi_c = .12$). The descriptive frequencies in Table 8 showed that most organizations across all adopter categories reported high levels of favorability towards remote work because of COVID-19. Organizations with the highest level of favorability towards the practice were identified as innovators (46%), while those with the lowest were laggards (27%).

Table 8. Organizations' Adopter Categories by Favorability

	I (*n* = 61)	**EA (*n* = 84)**	**EM (*n* = 216)**	**LM (*n* = 351)**	**L (*n* = 208)**
Favorability	**% (AR)**	**% (AR)**	**% (AR)**	**% (AR)**	**% (AR)**
Very favorable	46 (1.3)	39 (.3)	41 (.8)	42 (1.7)	**27 (-3.7)**
Somewhat favorable	28 (-1.8)	33 (-1.1)	36 (-.9)	39 (.3)	**46 (2.3)**
Indifferent	10 (-.1)	16 (1.7)	8 (-1.0)	**7 (-2.4)**	**15 (2.8)**
Somewhat unfavorable	**1 (-2.0)**	5 (-1.3)	**12 (2.1)**	8 (-.2)	9 (.1)
Very unfavorable	**15 (3.9)**	7 (1.1)	3 (-1.1)	4 (-.8)	3 (-1.0)

Note. I: *Innovators*, EA: *Early Adopters*, EM: *Early Majority*, LM: *Late Majority*, L: *Laggards,* AR: *Adjusted Residual*. To aid in interpretability, cells with AR greater or less than +/- 1.96 are bold to show where percentages vary from expectation.

A Pearson chi-square test found a statistically significant relationship between remote work practice and innovation-decision process stages ($\chi^2 = 129.01$, $p < .001$). The effect size was categorized as weak based on Cramer's V ($\phi_c = .17$). The descriptive frequencies in Table 9 indicated most organizations across all stages of the innovation-decision process had high levels of favorability towards remote work as a result of COVID-19. Organizations with the highest level of favorability towards the practice were from the confirmation stage (69%), while organizations with the highest level of unfavorability were from the knowledge stage (16%).

Table 9. Organizations' Stage in the Innovation-Decision Process by Favorability

Favorability	K (*n* = 419) % (AR)	P (*n* = 152) % (AR)	D (*n* = 219) % (AR)	I (*n* = 266) % (AR)	C (*n* = 122) % (AR)
Very favorable	**29 (-3.0)**	**27 (-2.2)**	**28 (-2.3)**	38 (1.3)	**69 (8.3)**
Somewhat favorable	**29 (-3.1)**	**42 (2.1)**	**42 (2.5)**	**41 (2.5)**	**18 (-4.1)**
Indifferent	**15 (2.4)**	11 (-.3)	11 (-.5)	12 (-.2)	**5 (-2.5)**
Somewhat unfavorable	11 (1.6)	14 (2.0)	10 (.1)	6 (-1.9)	**4 (-2.1)**
Very unfavorable	**16 (5.8)**	6 (-1.4)	9 (.1)	**3 (-4.1)**	**4 (-2.0)**

Note. K: *Knowledge*, P: *Persuasion*, D: *Decision*, I: *Implementation*, C: *Confirmation*, AR: *Adjusted Residual*. To aid in interpretability, cells with AR greater or less than +/- 1.96 are bold to show where percentages vary from expectation.

Discussion, Conclusion, and Implications

The purpose of this study was to describe the adoption process of remote work by organizations in the United States and the effect of COVID-19 on the practice. This study indicated most organizations in the sample already had remote employees. As this data was collected in the fall of 2020 during the COVID-19 pandemic, it was expected that most organizations would range between the decision and confirmation stages of the innovation-decision process. While adoption takes place in the decision stage (Rogers, 2003), most organizations were still in the knowledge stage. Findings showed organizational leaders reported high rates of remote work implementation while simultaneously reporting their organization was only aware of the practice and how it functioned. This inconsistency is most likely explained by the unanticipated and rapid implementation of remote work as organizations reacted to the COVID-19 pandemic. Under these conditions, it is possible for an organization to identify as being in the early pre-decision stages of the innovation-decision process while having remote employees in their organization.

With respect to time, results aligned with both DOI theory and the literature showing that adoption occurs slowly over several years (Bailey & Kurland, 2002; Martin, 2012). As remote work was introduced in the public sector in the late 1970s, the practice expanded gradually across the private sector in succeeding decades due in part to the limitations of ICTs and internet access (Gajendran & Harrison, 2007). These limitations explain why public and private sector organizations range widely from the knowledge to confirmation stages of remote work adoption. Although the not-for-profit sector was the smallest of all economic sectors, it made up the largest proportion of organizations in both the decision and implementation stages. Not-for-profits were also the most advanced sector in the innovation-decision process of remote work adoption.

Long-established organizations in the sample were the most advanced in the innovation-decision process of remote work adoption. These results addressed the concerns of Bailey and Kurland (2002), who indicated the effects of organizational size on the decision to adopt remote work required further research. Organizations in the implementation and confirmation stages of the

innovation-decision process of remote work adoption had more substantial budgets and employees. The organizations operating internationally were also in the later stages of the innovation-decision process compared to those operating only in the United States.

Results suggested COVID-19 accelerated the implementation of remote work in the United States. While most organizations reported already having remote employees, rapid implementation of a practice does not equate to adoption. Consistent with DOI theory, findings showed that remote work adoption is slow (Rogers, 2003). Consequently, organizations' progression through the innovation-decision process of remote work adoption should be expected to advance significantly in the years succeeding the pandemic.

Findings found the sample's distribution across all economic sectors was slightly disproportional towards later adopter categories (i.e., late majority, laggards). These findings corresponded with literature reporting the adoption of remote work occurring slowly over time (Bailey & Kurland, 2002; Dutton et al., 1987; Gajendran & Harrison, 2007; Hamilton, 2011; Martin, 2012; Mokhtarian, 1991; Useem, 2017). Results from the first research objective are also consistent, with most organizations categorized as later adopters, as most public and private sector organizations made up most of the decision and implementation stages of the innovation-decision process. Not-for-profits were the most advanced economic sector in the innovation-decision process; these organizations were also the largest sector of the sample in the innovators category.

Rogers and Shoemaker (1971) explained the negative impact of uncertainty on an innovation's rate of adoption. Uncertainty could explain the slow rate of remote work adoption prior to 2020. Older organizations with more employees, branches, and operations (local and abroad) were among most earlier adopters (i.e., innovators, early adopters, early majority). These findings are compatible with DOI theory, which explains how socioeconomic status affects innovativeness, as "earlier adopters have larger-sized units (farms, schools, companies) than do later adopters" (Rogers, 2003, p. 288). Rogers also stated that earlier adopters must "be able to cope with a high degree of uncertainty" (p. 282), and doing so requires substantial resources from the organization. These findings demonstrated that remote work adoption occurred in line with organizations' level of innovativeness, consistent with the element of time.

Results also showed an increase in remote work adoption in response to COVID-19. Most organizational leaders who implemented remote work in response to the pandemic considered the experience favorable. Organizations estimated that some employees would continue to work remotely after COVID-19. While studies on workplace practices during pandemics are limited, findings in this study were consistent with literature supporting remote work as a useful practice for circumventing the spread of infectious diseases (Cabaniss, 2020; Clancy, 2020; Dingel & Neiman, 2020; Guyot & Sawhill, 2020; Lutke, 2020). Based on the high favorability levels of

remote work in response to COVID-19, it is expected that organizations will continue to progress through the innovation-decision process of remote work adoption.

Not-for-profit organizations were the most advanced across the innovation-decision process of remote work adoption and the most innovative based on the adopter categories. These findings could be explained by the nature of how these organizations must use resources more efficiently than those in other sectors (Liket & Maas, 2015; Mitchell, 2013; Privett & Erhun, 2011). Larger organizations (in both size and scope) that are more established and have more resources appear to adopt remote work more rapidly and frequently than others.

Recommendations and Future Research

Leaders who understand the adoption process of remote work and factors influencing the adoption decision will more likely be effective in making informed decisions regarding how their organization evaluates the practice. Organizational leaders can use these results in the development of remote work as a formal workplace arrangement (or policy) and overcome common obstacles that cause untimely rejection of the innovation. For example, as most organizations rapidly implemented remote work in response to the COVID-19 pandemic, the ones with prior experience reported higher favorability towards the practice. It would benefit organizational leaders, especially those who reported having an unfavorable experience with the practice, to start in the knowledge stage by conducting small pilot programs, evaluating the results over time, and utilizing program participants (i.e., employees) in the co-creation of remote work policies. With a clearer understanding of the types of positions that are compatible with remote work post-pandemic, established organizations could expand existing policies to a greater number of employees.

An organizational task force focused on auditing and revising existing human resources policies concerning remote work could benefit leaders. By testing the practice through a series of pilot programs, perceptions of risk and uncertainty associated with remote work could be reduced. Testing could be highly impactful when conducted as part of the implementation stage before moving to the confirmation stage of the innovation-decision process. As worker productivity is notably important, recruiting employees with existing competencies necessary to function in an innovative remote work environment/culture would be advantageous. Given the changing nature of traditional workplace culture, training employees and leaders in remote work best practices could enhance their understanding of the process. Training in communication, productivity, planning, and performance are a few key topics.

Results from this study provide Cooperative Extension with insights into how it could respond to the widespread implementation and adoption of remote work across the United States. Social isolation, burnout, employee engagement, job ambiguity, and family conflicts are a few challenges related to remote work where Extension can focus on new and responsive programming. Existing Extension professionals may already have the expertise and skills to

develop programs targeting these topic areas. Other related needs Extension professionals could address in conjunction with remote work challenges are mental health, physical health and wellness, relationship, and workforce and economic development programming. In addition, new Extension education programs in key topic areas of remote work (e.g., communication, productivity, planning, and performance) would help Extension professionals respond to this shift in workplace practices with relevant, research-based educational programming.

Future research is needed to understand the long-term impacts of COVID-19 on remote work adoption in the United States. Replicating this study in the next three to five years can provide additional insights that further explain how the unanticipated implementation of remote work in response to COVID-19 influenced the decision to adopt or reject the practice. A qualitative research design may reveal a deeper understanding of remote work perceptions while also identifying nuanced barriers to its adoption. Investigation into the personal experiences of organizational leaders and employees would be useful in explaining why the practice of remote work was accepted or rejected within their respective organizations, especially after COVID-19. Examining competencies for remote work effectiveness among employees and leaders would be necessary as the widespread adoption of remote work brings attention to a new competency domain for employee and organizational success.

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