

When Disruption is the New Normal

The Impacts of the COVID-19 Pandemic on Technical Services in US Academic Libraries

Yuji Tosaka and Cathy Weng

As college campuses closed for in-person classes and shifted to online instruction due to the COVID-19 pandemic in spring 2020, US academic libraries also scrambled to provide continued access to library services and resources to support remote learning, teaching, and research. One important question is how academic library technical services responded to the public health emergency and adapted to new challenges to continue to serve the academic community. This paper illustrates a survey study that investigated the impact of the COVID-19 pandemic on US academic library technical services units in terms of disruptions and alterations of existing normal operations. The study revealed that technical services librarians and staff made determined efforts to continue performing as much of their pre-pandemic work as possible under the challenging circumstances. Unsurprisingly, library collection building practices and collection budgets were seriously affected by the pandemic. The study also showed the limitations of institutional preparedness and response to the public health emergency. Lastly, the study explored the personal experiences and perceptions of working from home during the pandemic and found no significant changes in work productivity, motivation, or concentration.

In January 2020, the first confirmed case of COVID-19 infection was reported in the United States. By the spring of that year, the new global pandemic evolved into a historic public health emergency, taking tolls on thousands of human lives and upending almost countless areas of the country's social and economic life. Not surprisingly, the pandemic also caused a widespread disruption to US academic institutions, which are home to thousands of students who are interacting and living in congregate settings on or near campus and thus can become a major source of the rapid spread of any communicable disease. As a result, almost all US colleges and universities cancelled in-person classes and shifted to online instruction in spring 2020.¹ Obviously, the massive fallouts from the pandemic created an urgent need to understand how organizations and individuals in all walks of life were forced to respond in real time to the novel demands and challenges that impacted them in the transformed work environments.²

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As campuses closed for in-person classes and shifted to online instruction in spring 2020, academic libraries across the country, with their decades of investment and practices in providing online resources and services, “helped lead their institutions into the socially distant era.”³ During these highly unusual and challenging times, those librarians and staff who had worked directly with students and faculty had to quickly adjust their operations using various new technologies and tools to transition to new ways of reaching out to library users and continuing to support their virtual learning, teaching, and research needs.⁴ While the adjustments librarians in public services made to the rapidly evolving virtual academic environments rightly deserve attention, an equally essential, if much less visible, question is how other non-public facing sides of academic libraries, such as technical services, ensured service continuity in response to the pandemic.

Organizational impacts of the ongoing COVID-19 crisis on the academic library technical services work environments raised considerable interest for the authors, both of whom have years of professional experience in technical services units.⁵ The sudden disruption of work sparked the authors’ academic and practitioner interest in exploring how their technical services colleagues across US academic libraries tried to maintain continuity of operations in the wake of the unprecedented pandemic. This paper reports the findings of a nationwide online survey that the authors designed and conducted in fall 2020 to assess the pandemic’s impact on US academic library technical services units. Analysis of the survey data will make a much-needed empirical contribution to understanding how the nature of technical services work was disrupted and altered within a historic, unprecedented pandemic context.

Literature Review and Study Questions

When the COVID-19 pandemic unfolded, many groups quickly developed and conducted surveys collecting information almost in real time on how libraries across the US were making adjustments to their operations to protect the safety of their staff and still continue to serve the needs of their users. The institutional focus of these COVID-19 library surveys often varied widely, such as US libraries in general, public libraries, academic libraries, and special library communities like law libraries.⁶ They each offered important contemporaneous insights into how the US library community was responding to the COVID-19 outbreak and provided valuable information. Sharing this information allowed other libraries to make decisions and adjust existing services and workplace processes; the need to adapt and evolve was paramount in fast-changing pandemic situations. Nevertheless, while these surveys indeed

were helpful in affording broad overviews of US library responses to the pandemic, they left a critical vacuum in knowledge as to how particular library units, such as access services, public services, and technical services, navigated through significant disruptions to their operations respectively. Studies have since begun to explore such individual unit-level responses to the historic public health crisis.⁷

Another important body of the library literature that proved of particular interest to the authors during the study preparation process was writings on emergency preparedness and disaster response in libraries. As the authors reviewed a good number of library-specific publications and manuals on this topic, they soon realized that those resources mostly focused on how to preserve and restore physical collections and buildings and ensure service continuity when libraries were struck by natural disaster events, such as fire, earthquakes, hurricanes, and floods.⁸ One notable exception that was highly relevant to the current study was a 2013 paper by Fansler and Daugman that discussed how the Z. Smith Reynolds Library at Wake Forest University developed a pandemic preparedness plan in response to the 2009 H1N1 pandemic outbreak.⁹ The existing literature focusing on non-pandemic disaster responses thus prompted a clear need for research in libraries’ preparedness and response to public health emergencies such as the COVID-19 pandemic to guide academic libraries in general and/or technical services units through making timely adjustments in their operations.

A key set of questions that affected the authors’ survey design related to the impacts of the sudden shift to remote work on academic library technical services operations. Craft offered a concise overview of the pre-pandemic literature on the concept and practice of remote work in library technical services.¹⁰ Important questions in the literature included “technology access, including hardware, software, and Internet connectivity”—whether academic institutions provided adequate access to technologies needed to enable all technical services tasks to be performed remotely.¹¹ Other key questions encompassed the personal experiences and perceptions of remote work, including social and psychological costs and benefits such as increased productivity and higher employee morale, along with cost-saving opportunities for employers.

As outlined above, because the COVID-19 pandemic upended almost all the normal routines in people’s lives and work, the authors believed that the current situation created an urgent need to conduct an in-depth analysis of its ongoing and potential future effects on technical services in US academic libraries. Toward that end, the authors sought to design and conduct an online survey to help provide empirical insights into the following main study questions:

- How did the pandemic impact library operations, including the financial resources and collections priorities, as they affected technical services units?
- How did technical services units respond to the COVID-19 pandemic in terms of department operations?
- How did technical services librarians adjust to the transition to remote work? What were their perceptions about the benefits and costs of working from home in a pandemic environment?

Answering these questions will contribute a great deal to learning about how US academic library technical services confronted organizational challenges and demands under the historic public health crisis. As the changes made in workflows and operations were based on increased adoption of existing technologies for remote work and real-time communication, it seems quite plausible that those pandemic-era changes could also trigger long-term transformations, affecting our priorities and how the work of academic library technical services will be conducted moving forward.¹² Analysis of the current survey results therefore should serve as a good starting point in formulating best practices to help shape more flexible, resilient work environments as libraries likely will bring growing attention to disaster preparedness and continuity of operations in post-pandemic contexts.

Survey Design and Procedures

Based on a review of the existing literature and the earlier COVID-19 library surveys cited above, the authors developed an online survey instrument targeted at the technical services community across US academic libraries. The survey consisted of twenty-five questions covering a range of issues informed by the study questions listed in the previous section, and included four broad sections:

1. demographic/background information;
2. university/college and library COVID-19 responses;
3. impacts on technical services management and operations; and
4. perceptions of working remotely.

The number of questions each survey participant answered was slightly fewer and varied depending on the applicability and choices of answers given to certain questions. Most of the survey questions were multiple-choice, and many allowed respondents to select multiple categories and provide open-ended answers if applicable (see appendix).

The authors secured institutional review board approval for the proposed study and used Qualtrics as the online

platform for anonymous data collection. In September and October 2020, potential respondents were invited to participate in the survey by means of email announcements and follow-up reminders to relevant technical services-related electronic mailing lists/discussion forums.¹³ A total of 579 people responded and agreed to participate in the online survey. Of these respondents, 474 people (81.2 percent) reported that they were based in higher education institutions located in the US. The following sections present analysis of the survey data as reported by these US-based academic library respondents.

As noted above, many of the survey questions included an open text box to accommodate write-in answers in place of, or in addition to, pre-set answers (a total of eighteen open-ended items). To analyze all individual free-text answers, the authors developed a preliminary coding scheme to incorporate them into analysis. The initial codes included all the choices given in the survey and new categories defined based on the responses. Each author then coded half of the free-text responses to a given question and identified answers that were not immediately clear and needed further discussion. The authors then refined the coding scheme, discussed questionable answers, and agreed on appropriate coding for those answers after additional review. In addition to being quantified for data analysis, free-text responses are discussed in the following sections as needed, and mostly for illustrative purposes.

Sample

The survey received responses from all across the US, with the exception of Alaska, Maine, Puerto Rico, Vermont, West Virginia, and Wyoming. Nearly 60 percent (59.7 percent) of the respondents reported that they worked at doctorate-granting universities, while 17.1 percent were at 4-year undergraduate institutions. Furthermore, 13.5 percent of the respondents were affiliated with master's colleges and universities, while 5.3 percent and 4.2 percent worked at 2-year colleges and special focus institutions (e.g., law schools, medical schools, and art, music, and design schools), respectively. One respondent worked at a tribal college. A total of 57.0 percent of the respondents held positions in public institutions. Regarding library type, nearly half of the respondents (48.2 percent) responded that their institutions were Association of Research Libraries (ARL) members, meaning that they worked at one of over 100 major research libraries. In the results section that follows, the distinction between ARL and non-ARL library respondents is used in some analyses as a measure to highlight possible differences between research and non-research libraries regarding technical services responses to the COVID-19 pandemic. Considering that the percentage of doctoral universities is much lower overall (10 percent of

US postsecondary institutions and 36 percent of the total enrollment), the current survey sample data suggest that the responses were skewed toward those working in such major research libraries.¹⁴

In addition to library types, the survey included a question about survey participants' primary job function. The question allowed them to select multiple categories if they were responsible for more than one functional area, as often is the case in a smaller library setting where one handles multiple technical services functions, for example. The largest proportion of the respondents (71.1 percent) indicated cataloging and metadata as their primary job function, followed by acquisitions (32.2 percent). A slightly smaller number of the respondents replied that their primary job function was in electronic resources (31.3 percent) and serials (24.8 percent), respectively. Digitization and preservation accounted for 6.9 percent of the responses. About one out of ten respondents (10.2 percent) reported that they had management or coordinating responsibilities (e.g., head of technical services) or administrative positions (e.g., associate university librarian for collections & metadata services). The survey respondents also included a much smaller number of those working in public services and collection development (3.2 percent), systems and access services (1.7 percent each), and archives and special collections (1.5 percent). In general, while the authors used self-selection sampling for the current study, the respondents represent a large relevant cross-section of technical services librarians across US academic libraries.

Results

Library Onsite Operations

The survey study was conducted in fall 2020 when most academic institutions started their new academic year and when vaccination was not yet available. Regarding the status of library onsite operations, more than half of the survey participants (54.1 percent) indicated that their libraries were open with limited hours when the survey data were collected. Nearly one-fifth of the respondents (18.9 percent) reported that their libraries were closed entirely to users. By contrast, 15.9 percent of the survey participants responded that their libraries were open with usual hours. The remaining 10 percent reported that their libraries were closed with the exception of some bookable study space; and that not all branches were open and those that were had limited hours.

When the pandemic started to affect technical services units in March 2020, almost all academic institutions in the US closed their onsite operations and classes moved to online. In light of the library being an integral part of academic lives, the survey asked respondents if their library/

libraries had been designated as essential units and stayed open in some capacity since the pandemic started. Of those who responded, more than one-third of the institutions (37.2 percent) had designated their libraries to stay open during the pandemic. Over half (53 percent) of these institutions were non-ARL libraries, suggesting that there were few policy differences on this operational issue between ARL and non-ARL libraries regarding their overall distribution in the survey sample.

Access to Print Materials

To learn about the status of access to print materials, the survey included a question with the following answers; respondents could select all applicable answers.

- Access to print materials continues in person and is only onsite
- Access to print materials is staff-mediated and onsite only
- Access to print materials is staff-mediated and via delivery
- Access to print materials is staff-mediated and via specified offsite pickup location
- Access to print materials is staff-mediated and via digital reproduction requests
- Access to print materials has been suspended

The results (see table 1) showed that more than 40 percent of the respondents' institutions offered at least one of the three types of services at the time of the survey: (1) in-person access to materials in stacks; (2) staff-mediated access to print materials via delivery; and (3) staff-mediated access to print materials via digital reproduction.¹⁵ Fewer institutions provided staff-mediated access via onsite pickup (30.5 percent) or offsite pickup (26.7 percent). A very small percentage (4.7 percent) of respondents reported that their libraries had entirely suspended access to print materials. Looking further into the access policy differences between ARL and non-ARL institutions, the authors found that more non-ARL institutions opened their stacks for users' in-person access than did ARL institutions, whereas more ARL institutions offered delivery service to their users.

Pandemic Preparedness

One of the survey questions was intended to examine how well academic libraries were prepared for disasters: specifically, whether academic libraries had disaster plans in place to help manage the pandemic crisis and the usefulness of such pre-existing plans. According to the survey results (see table 2), approximately half of the respondents indicated that their institutions had a disaster plan prior to

Table 1. Access to print materials (N = 423)

	All (%)	Library Type	
		ARL (%)	Non-ARL (%)
In person, on site	43.3	37.8	48.2
Staff-mediated, on site	30.5	32.8	28.4
Staff-mediated, delivery	40.2	45.3	35.6
Staff-mediated, offsite pickup	26.7	25.9	27.5
Staff-mediated, via digital	42.3	41.8	42.8
No access	4.0	5.4	4.7

Table 2. Disaster Plan in Place (N = 431)

	All (%)	Library Type	
		ARL (%)	Non-ARL (%)
Yes	51.0	55.3	47.1
No	16.3	11.0	21.1
Other	0.4	0.0	0.8
Not sure	32.3	33.8	31.0

the COVID-19 outbreak. However, almost all those respondents who provided free-text responses noted that their emergency plans, in fact, had been created for emergencies such as fire or flood, rather than a pandemic. The authors also cross-tabulated the results to see if any disparities existed between ARL and non-ARL institutions having disaster plans. As can be seen from table 2, more ARL institutions (55.3 percent) had a disaster plan than did non-ARL institutions (47.1 percent). This is also reflected in the “No” category where non-ARL institutions were almost twice as likely to have had no such plan than ARL institutions. Additionally, nearly one-third of the respondents (32.3 percent) did not know whether their libraries had a disaster plan, suggesting that such a plan was not widely made known to the staff. Among those respondents who were aware that a local disaster plan was in place prior to the pandemic, approximately 40 percent found their plans useful at some levels. Nearly one-third (32.6 percent) of the respondents felt that their emergency plans were either somewhat useless or extremely useless (see table 3).

Equipment and Technical Support

Equipping library staff for remote work posed a challenge during the pandemic. Basic home office needs such as computers and internet access are fundamentals for remote work to succeed. One survey question asked how such technical needs were fulfilled locally. According to the survey results

Table 3. Perceived Usefulness of Disaster Plan (N = 233)

Extremely useful	6.0%
Somewhat useful	34.3%
Neither useful nor useless	27.0%
Somewhat useless	18.0%
Extremely useless	14.6%

Table 4. Technical and Equipment Support for Remote Work (N = 424)

Yes, to all employees in need	44.8%
Yes, to some employees in need	31.4%
No	10.1%
Other	3.8%
Yes, computers and tech support only, no internet	9.9%

(see table 4), nearly one-third of the respondents (31.4 percent) answered that their institutions provided technical equipment and support to *some*, but not all, employees, while all employees in need received such support in more than 40 percent of the respondents’ institutions (44.8 percent). A total of 10.1 percent of the respondents reported that their institutions provided no computers or technical support, while nearly 10 percent of the respondents’ institutions provided computers and technical support, excluding internet access.

Policy Regarding Library Staff Unable to Work Remotely

Another survey question inquired about the institution’s policy regarding employees who lacked access to the technology that will enable them to work remotely. Were they paid or forced to take leave, etc.? Based on the survey results (see table 5), the authors note that more than 20 percent of the respondents’ institutions continued to pay their employees who were unable to work remotely. Moreover, 16.1 percent of the respondents’ institutions required staff who could not work remotely to work onsite if they wanted to get paid. Employees of some institutions (10.6 percent) were required to use vacation or sick time to get paid.

Technical Services and Pre-pandemic Remote Operations

It is generally understood that library technical services is a physical operation unit that handles, among other responsibilities, the receiving, cataloging, and processing of physical materials acquired by the library. As noted in the literature, remote technical services work has been implemented as

an exception rather than as a norm and often individual-based.¹⁶ One can easily imagine the challenges the academic library community encountered when most (if not all) of the technical services operations were shifted to remote work almost overnight in the wake of the COVID-19 outbreak. A scan of pre-pandemic institutional practice with respect to technical service remote work will better illustrate the scale of this crucial transition in a real-time context. Toward that end, the survey asked if technical services employees were permitted to work remotely by their institutions before the lockdown. Based on the survey results and free text responses, the authors grouped the responses into the following categories:

- Generally no with occasional exceptions
- Generally yes and needed special permission or arrangements
- Yes to only librarians and certain classes of employees

The results (see table 6) showed that more than half of the respondents' institutions (51.8 percent) generally had not allowed technical services staff to work remotely prior to the pandemic; non-ARL institutions outnumbered ARL institutions having adopted this practice (57.0 percent and 46.2 percent, respectively). Approximately one-fifth of the respondents (21.9 percent) replied that their institutions had given technical services employees the green light for remote work with the condition that special arrangements or permission needed to be granted. Close to a quarter of the respondents (23.7 percent) reported that remote work practice had been only applicable to librarians/library faculty or staff in certain classes. Among the institutions in this category, the survey found that more ARL libraries had adopted the limited remote work practices before the pandemic (29.5 percent versus 18.4 percent among non-ARL libraries).

Technical Services and Pandemic Remote Work

As the survey data above suggest, technical services units had to adjust their operations quickly to ensure business continuity when the pandemic struck, as remote work was only implemented as an exception in the past. This involved shifting most, if not all, technical services work remotely with the understanding that most physical processing and

Table 5. Policy on Staff Lacking Access to Computers/Technology Support (N = 432)

Not required to work but have been paid	21.2%
Required to use vacation/sick time in order to get paid	10.6%
Required to work on-site	16.1%
Have not been paid	3.6%
Don't know	11.1%
Not an issue (not applicable)	35.8%
Initially paid for no work, then required to work on-site or furloughed or laid off	5.5%

Table 6. Technical Services Remote Work Practice, Pre-COVID 19 (N = 438)

	Library Type		
	All (%)	ARL (%)	Non-ARL (%)
Generally no and with occasional exceptions	51.8	46.2	57.0
Generally yes and with special permission or arrangements	21.9	21.0	22.8
Only for librarians and certain classes of employees	23.7	29.5	18.4
Other	2.5	3.3	1.8

cataloging operations might need to be stalled; hence a survey question—what types of technical services work were assigned to staff in a remote setting? Specifically, the respondents were asked, from a list of tasks, to select the type of work assigned to staff in percentages that added up to 100 percent. The list included:

- Remote work comparable to existing onsite duties
- Remote work different in nature
- Database cleanup tasks
- Department documentation
- No remote work available for them
- Regular job duties continued while working remotely
- Other

Table 7 presents the percentage of respondents indicating the types of remote work assigned in their technical services units and the median percentage of each type among all work they did remotely. As a measure of central tendency, the authors used the median percentage (value separating the higher half from the lower half of a data sample) to avoid data being skewed from outliers, i.e., the extreme high or low percentages in some of the responses received; indeed, the results of the weight of work in percentage were not evenly distributed, as expected, among all work types the respondents entered. The authors also generated the distribution of remote work that was given the highest percentage by the respondents to add another layer of analysis to the findings.

The results (see table 7) show that the top three remote work tasks that the respondents selected were “database

Table 7. Remote Work Assigned in Technical Services (*N* = 371)

	Work type assigned (%)	Median percentage of work type, by weight (%)	Distribution of respondents who gave the highest percentage for each work type (%)
Database clean-up	71.5	20	24.3
Regular job duties continued	69.9	50	41.8
Remote work comparable to onsite work	56.3	25	21.6
Department documentation	44.8	10	1.1
Remote work different in nature	35.6	20	3.2
No remote work to do	9.9	10	1.9
Other	19.6	20	6.2

clean-up” (selected by 71.5 percent), “regular job duties continued” (69.9 percent), and “remote work comparable to onsite work” [e.g., some workflow adjustments] (56.3 percent). These tasks were followed by “department documentation” (44.8 percent) and “remote work different in nature” [e.g., special projects or other departments’ duties] (35.6 percent). “No remote work to do” was selected by nearly one-tenth of the respondents (9.9 percent). Note that the numbers in this column exceeded 100 percent in total because respondents could select multiple work tasks. When further examining the weight of remote work assigned using the median percentage, the authors found that those who selected the type “regular job duties continued” indicated that half of the work technical services staff did remotely were their regular duties. This was further reaffirmed by the high percentage (41.8 percent) of respondents who gave their highest percentage of remote work, among other duties, to this work type suggesting many of their regular responsibilities could be accomplished from home. By contrast, more than 70 percent of respondents selected “database clean-up” as one of their remote work tasks (i.e., the top answer chosen); its median percentage among all remote work was 20 percent. Approximately one-quarter of respondents (24.3 percent) assigned this work type the highest percentage of their remote work. This suggested that database clean-up was a common alternative when onsite work and physical items handling were not possible; however, that type of work only accounted for 20 percent in median percentage of all remote work according to the survey results.

Library Management System

Technical services tasks depend heavily on the library management system for daily operations. For libraries using traditional integrated library systems (ILS), which are built mostly on client-server architecture, remote technical

services work can be tricky when it needs to be performed outside the institution’s local network. Generally, a virtual private network (VPN) needs to be enabled for staff to remotely access the library system. However, a newer library services platform (LSP), with its cloud-based technologies, creates a more convenient environment for remote access. Use of ILSs or LSPs might have affected library technical services remote operations during the pandemic. One of the survey questions thus asked whether the respondents’ library management system (LMS) caused any issues for remote work. The results (see table 8) indicated that most respondents (83.9 percent) did not experience issues with their library systems. However, examining the cross-tabulated data to compare LSP and ILS institutions, the authors found some distinct difference in the percentage of the respondents reporting remote work issues with their library systems. The vast majority of the respondents (89.2 percent) whose libraries deployed an LSP system found no issue using their system for remote work, and 77.4 percent of respondents from libraries using an ILS system selected the same answer. However, of those who responded that their LMS presented issues for their remote work, approximately 12 percent of the respondents from ILS institutions reported issues with their library systems, as opposed to less than 3 percent of the respondents from LSP institutions. The text responses revealed that most issues were indeed VPN-related.

Cataloging Operations

What did the survey responses reveal about the status of academic library cataloging operations in fall 2020? As shown in table 9, regarding the cataloging of physical items, (which obviously needed catalogers’ in-person access to them unless they were cataloged from surrogates), nearly half of the respondents (47.1 percent) indicated that it was continued as usual or with adjustments in the local

procedures. Further examining the data, the authors found that non-ARL library participants who responded with this answer outnumbered ARL library participants by nearly 10 percent (51.6 percent versus 41.9 percent). Over one-third (36.4 percent) of the respondents reported that cataloging of physical items continued, but those cataloging activities partially shifted to handling electronic resources (e-resources). Such partial shifts were reported slightly more by those working in ARL libraries (39.2 percent versus 33.9 percent). By contrast, 6.9 percent of the respondents reported that all cataloging and processing of physical items remained suspended at the time of the survey, and that cataloging staff had completely shifted to handling e-resources; a significant difference was not observed here between ARL and non-ARL libraries.

Acquiring New Library Resources

As US colleges and universities shifted to remote operations in spring 2020, selection of new library resources and collection development to support the academic needs continued. With the operational shifts, it has become a natural solution for library collection development strategies to prioritize e-resources in an increasingly digital information

landscape. To explore the nature and extent of changes in building academic library collections, the authors asked the respondents how their acquisition services responded to meeting the remote needs regarding the preference of the materials formats acquired during the pandemic. The survey results (see table 10) showed, as expected, that nearly two-thirds (64.1 percent) of the respondents' libraries partially shifted to acquiring more e-resources. Less than 10 percent of the respondents answered that their libraries shifted to exclusively acquiring e-resources. Examining the survey responses further, the authors found that more non-ARL institutions (11.0 percent) adopted this e-only model than did ARL institutions (6.5 percent). For institutions without shifts in acquisition of resource formats, the survey data showed that non-ARL libraries outnumbered ARL institutions (20.6 percent versus 15.6 percent).

Collection Budgets

The fiscal impact of COVID-19 on higher education has been well-documented; financial challenges such as operating deficits due to declines in revenue (enrollment, net tuition, and auxiliary revenues) and COVID-related expenses have been widely observed across college campuses.¹⁷ As a result, organizational budget reduction efforts have been commonly implemented across US academic libraries. This has affected institutional buying power for acquiring new materials. To identify the financial impacts resulting from the pandemic, the current survey included a question about the collection budget situations in the respondents' institutions. Based on the survey responses

Table 8. Remote Work Issues with Library Systems (N = 372)

	All (%)	LSP (e.g., Alma, WMS) (%)	ILS (e.g., Aleph, Voyager) (%)
No	83.9	89.2	77.4
Yes—mainly VPN	7.0	2.9	11.9
Yes—Other	9.1	7.8	10.7

Table 9. Status of Cataloging Operations (N = 407)

	Library Type		
	All (%)	ARL (%)	Non-ARL (%)
Cataloging of physical items continued as usual or with adjusted procedures	47.1	41.9	51.6
Cataloging of physical items continues and also partially shifted to handling e-resources	36.4	39.2	33.9
All cataloging/processing of physical items suspended, complete shift to handling e-resources	6.9	6.5	7.2
Other	9.6	12.4	7.2

Table 10. Changes in Acquisitions Formats (N = 404)

	Library Type		
	All (%)	ARL (%)	Non-ARL (%)
Completely shifted from physical to e-resources	8.9	6.5	11.0
Partially shifted to acquiring e-resources	64.1	63.4	64.7
Continue to acquire both physical and e-resources with no shift	18.3	15.6	20.6
Other	8.6	14.5	3.7

Table 11. Changes in Collection Budgets (N = 390)

	Library Type		
	All (%)	ARL (%)	Non-ARL (%)
Budgets have not been affected	19.5	13.2	25.0
Budgets have been partially decreased	62.1	64.8	59.6
Budgets have been completely taken away	2.1	2.7	1.4
Budgets have been increased to support online academic needs	2.1	2.7	1.4
Don't know/Other	14.4	16.5	12.5

(see table 11), the majority of the respondents' institutions (62.1 percent) experienced partial cuts in their collection budgets, a finding that probably should come as no surprise as to the pandemic financial fallout. This impacted slightly more ARL institutions (64.8 percent) than non-ARL institutions (59.6 percent). By contrast, nearly one-fifth of the respondents indicated that their institutions' collection budgets had not been affected. Among those institutions, there was a marked difference between ARL and non-ARL institutions, however. Exactly a quarter of the non-ARL respondents answered that their institutions' collection budgets were not affected, as opposed to 13.2 percent of the respondents from ARL institutions. A very small percentage of the respondents (2.1 percent) answered that their collection budgets were completely eliminated, while this was apparently balanced by the equal percentage of the few institutions where collection budgets increased to support the needs for remote teaching and research amidst the pandemic disruption.

Experiences and Perceptions of Remote Work during the Pandemic

As noted earlier in the Survey Design and Procedures section, the last segment of the current survey featured a set of questions intended to evaluate how those working in academic library technical services perceived their lived experiences of working remotely during the COVID-19 pandemic. Those questions reflected the authors' particular interest in exploring the pandemic's impact on the social and emotional well-being of individual technical services personnel as they found that the existing COVID-19 library surveys had focused more broadly on examining policy adjustments made by libraries responding to the evolving pandemic conditions.¹⁸ For that purpose, in addition to adapting questions from those surveys distributed to the library community, the authors proceeded to cast a wider net and draw on survey questions in the non-library literature that had been tested to produce valid results relating to the positive and negative experiences of remote work in a broader post-disaster context. The final survey included two sets of scales adapted from

Donnelly and Proctor-Thomson, who had developed survey questions to measure "home-based telework" experiences in the aftermath of the 2011 New Zealand earthquake. Based on the previous scales used in other existing remote-work studies, their scales, consisting of twenty-two items, were

designed to measure the "improved work outcomes" and "social costs/benefits" of working remotely under emergency conditions, such as work-life balance, family caring responsibilities, and work productivity and motivation.¹⁹

The first set of questions (see table 12) were designed to measure the extent to which remote work led to improved work outcomes for survey participants. Most notably, 77.3 percent and 83.0 percent of the respondents respectively agreed ("strongly agree" and "agree") that remote work allowed them to feel an increased sense of personal safety and have more flexibility than working in the office while the pandemic was still actively ongoing (4.18 and 4.11 in mean scores respectively, on a scale from 1 [= strongly disagree] to 5 [= strongly agree]). Not surprisingly, more than three-quarters of the respondents (77.3 percent) agreed that working remotely saved money, such as commuting expenses (mean of 4.05). It also appears that remote work enabled many respondents to achieve better work-life balance, as highlighted by the relatively high mean score of 3.84 for "help with caring responsibilities" and 3.63 for "have more time for my family"—a pressing concern for those caring for family members as the pandemic led to a prolonged shutdown of schools and daycare facilities for younger children and adults across the country. Likewise, reduced commuting stress (3.90), more independence (3.66), and control over their work environment (3.65) were also identified as among the key benefits of working remotely. A slight majority of the respondents (51.4 percent—3.38 mean score) agreed that remote work afforded them more personal time during the pandemic. By contrast, working remotely seems to have had marginal effects on work motivation (2.95), productivity (3.13), and concentration (3.18). These survey responses suggested that US technical services librarians and managers in academic libraries had an overall positive experience while working remotely during the COVID-19 pandemic.

The second set of questions about pandemic remote work experiences were designed to explore their social costs and benefits as reported by the respondents (see table 13). The most notable social costs they experienced were social and professional isolation (4.08 and 3.75 in

Table 12. Remote Work Outcomes ($N = 385\text{--}387$)

Working remotely allowed me to ...	Strongly agree (%)	Agree (%)	Neither agree nor disagree (%)	Disagree (%)	Strongly disagree (%)	Score
Have more control over my work environment	25.0	38.0	17.8	15.4	3.7	3.65
Have more independence	23.9	32.7	30.9	10.1	2.4	3.66
Save money (e.g., commuting expenses)	37.8	39.5	14.9	5.7	2.2	4.05
Help with caring responsibilities	29.3	38.3	22.7	6.6	3.1	3.84
Get more work done	14.3	22.3	34.5	20.2	8.8	3.13
Work with greater concentration	17.4	25.9	22.7	25.3	8.7	3.18
Stay motivated	8.7	21.4	34.0	28.2	7.7	2.95
Reduce the stress of commuting to work	36.1	31.8	21.6	7.4	3.1	3.90
Have more time for myself	22.9	28.5	21.3	18.1	9.3	3.38
Have more time for my family	24.3	35.4	23.7	12.3	4.2	3.63
Have more flexibility	36.3	46.7	10.3	5.3	1.3	4.11
Feel safer than I would have felt working in the office	50.8	26.5	15.0	5.6	2.1	4.18

Note: Mean scores on a scale from 1 (strongly disagree) to 5 (strongly agree). Percents and mean scores exclude N/A responses.

mean scores respectively), plus reduced mutual learning among employees (a mean of 3.56), showing that working remotely led to heightened strains in professional relationships and communication in the new, often virtual, pandemic work environment. A slight majority of the respondents also reported (54.5 percent—“strongly agree” and “agree”) that remote work resulted in “different work duties” (3.31), a result that largely matched the survey data reported in the earlier section highlighting the disruption of work conditions following the onset of the COVID-19 pandemic. By contrast, the other negative social consequences of remote work were experienced to a lesser degree by the respondents. Most of them indicated that remote work neither led to the loss of visibility and career development (2.99), reduced motivation to work (2.78), nor reduced cooperation among employees (2.78). Even fewer respondents reported the other social costs of working from home in relation to reduced work output (2.58), lower staff commitment to their organization (2.53), and increased family conflicts (2.34). In sum, while the sudden shift to remote work across US academic libraries challenged technical services librarians and managers to deal with feelings of isolation and a lack of regular interactions with their colleagues, it seemed that such an uncertain, unprecedented work environment also produced an interesting set of newly found social benefits and work outcomes for them within a pandemic context, such as better work-life balance achieved with few changes in productivity and morale and more time to spend with

their family at home.

Discussion

The data reported in this paper provided a good snapshot of the pandemic experiences and perspectives of technical services librarians and managers across US academic libraries, and illustrated how the community responded to the challenges (and in some ways opportunities) created by the COVID-19 public health emergency. At the time of the survey (fall 2020), nearly all the respondents' institutions remained closed offering predominantly virtual classes, with some in-person classes like lab courses offered as needed. As faculty and staff worked remotely and students continued mostly to study online from their homes, academic libraries continued to find it necessary to adjust their operations to meet the needs of their remote users during these difficult times.

The survey found that more than one-third of the respondents' libraries had been designated as an essential service to stay open during the pandemic, likely reflecting their position as the campus intellectual center. Not surprisingly, however, normal library operations remained heavily curtailed, with little more than 15 percent of the libraries open onsite with regular hours at the time of the survey. COVID-19 restrictions also limited onsite access to print library materials severely, though substantially more so in research libraries. By contrast, while various forms

Table 13. Remote Work Social Costs/Benefits (N = 380–385)

Working remotely led to ...	Strongly agree (%)	Agree (%)	Neither agree nor disagree (%)	Disagree (%)	Strongly disagree (%)	Score
Loss of professional interaction	22.7	48.3	13.5	12.7	2.9	3.75
Loss of social interaction	32.3	52.6	7.7	6.1	1.3	4.08
Reduced mutual learning among employees	14.1	47.3	20.1	17.1	1.4	3.56
Reduced cooperation among employees	6.6	20.6	22.8	40.7	9.3	2.75
Lower staff commitment to their organization	3.2	11.4	35.0	36.1	14.3	2.53
Loss of visibility and career development opportunities	6.5	26.1	32.6	29.1	5.7	2.99
Reduced motivation to work	6.6	21.4	27.2	33.5	11.3	2.78
More family conflicts	4.0	10.7	24.1	38.1	23.2	2.34
Lower work output	5.3	18.6	24.1	33.2	18.8	2.58
Different work duties	11.6	42.9	18.3	19.3	7.9	3.31

Note: Mean scores on a scale from 1 (strongly disagree) to 5 (strongly agree). Percents and mean scores exclude N/A responses.

of staff-mediated access were implemented during the pandemic, delivery of library materials to users was notably much more prevalent in ARL libraries (a reverse 10-percent difference). For pandemic preparedness and risk management, while disaster plans had been in place at about half of the respondents' libraries, few felt that they were "extremely useful" in dealing with the COVID-19 pandemic and only about one-third saw them as "somewhat useful"—suggesting the limitations of most pre-existing library disaster plans (which had been designed largely to address emergencies like fire and water damage) in preparing for the magnitude of major public health emergencies like the one that shut down much of the nation in spring 2020. The finding that nearly one-third of the respondents were not sure whether their libraries had a disaster plan also suggested a need for regular communication of organizational disaster plans and appropriate training and exercises to enable more coordinated efforts in helping to build preparedness for emergency responses.

Regarding the work conditions and arrangements of librarians and staff in technical services, the authors found a series of interesting perspectives and challenges caused by the pandemic. These included arrangements of technical services work that could be performed remotely (or made possible to be performed remotely) and the necessary technical support. In the pre-pandemic environment, remote work had been rare for library technical services. The current study showed that about three-fourths (73.3 percent) of the respondents' technical services units generally had not allowed any remote work prior to the COVID-19 crisis or had allowed remote work only with special permissions/arrangements—results that clearly suggested

the sheer magnitude of the pandemic's impact of remote work on academic library technical services (see table 6). One important question was that of technical infrastructure required to support the sudden shift to remote work, such as computer equipment, high-speed internet connection, and remote VPN access to library management systems. Although much of the needed support was made available at most libraries, according to the survey responses, it was also heartening to learn that for those lacking technology access and thus unable to work remotely, initially or later during the pandemic, some form of paid leave was made available by their institutions to help staff get through the crisis.

The new reality of remote work during the pandemic also led to some necessary adaptations in academic library technical services operations. The survey responses indicated that to minimize business interruptions and ensure service continuity, technical services units could continue regular responsibilities remotely or undertake comparable online work assignments. The finding that a significant percentage of the work technical services staff did remotely were their regular responsibilities suggests that many technical services responsibilities can be accomplished remotely. This will facilitate and support libraries' potential future flexible work arrangements for technical services units. The results of notable shifts to acquiring and processing e-resources also seemed to demonstrate the importance of having the flexibility and adaptability needed for crisis management. Additionally, as much of technical services work is tied to components and functions available in library management systems used locally, the survey found that newer cloud-based LSPs had distinct advantages in supporting

remote work during the pandemic, allowing librarians and staff seamless access and flexibility to work from anywhere with an internet connection. Not surprisingly, the survey data also showed a major shift of usage and acquisition from print to e-resources occurring since the pandemic started, which obviously was intended to meet the urgent needs of remote instruction across US campuses. At the same time, campus closures and the shift to remote learning hit academic institutions hard financially, and most of the respondents' acquisitions units experienced retrenchments in collections budgets due to the COVID-19 financial shock.

Not only did COVID-19 impact technical services operations, it also brought forth the potential for reshaping the internal culture of technical services work as more people started working remotely. In this regard, the survey data generally painted a picture of the respondents adjusting smoothly to working remotely in flexible and safe home office settings as the libraries were closed. In addition to feelings of personal safety and flexibility, other major benefits included not having to commute daily (e.g., reduced travel expenses and stress), improved work-life balance (e.g., more time to care for and spend with family members), more independence, and working in the comfort of the home. That no significant changes were felt in work productivity, motivation, or concentration could be taken as a positive sign that technical services librarians are able to continue their work as effectively in their homes. By contrast, the key downsides of remote work included feelings of isolation and reduced mutual learning, which were obviously heightened at a time when people had to handle uncertainty and anxiety surrounding the novel global pandemic while losing direct, normal communication in their regular office environments. Remote work clearly had the impact of forgoing the informality and integration among technical services staff that can only be possible by being onsite. Notably, however, new ways of working and communicating remotely did not seem to have adverse effects on the level of organizational commitment among the respondents. Considering the generally positive view of remote work experiences within the pandemic context, it hardly would be surprising if the lasting influence of the COVID-19 crisis will translate to some significant, long-term changes in the physical dimension of technical services work in US academic libraries, particularly as new technologies increasingly allow more work to be done remotely.

Conclusion

The current study aimed to provide a contemporaneous snapshot of the effects of the historic COVID-19 pandemic on technical services operations in US academic libraries. While contributing significantly to understanding how they

weathered unprecedented pandemic challenges engulfing the nation, this paper is not without limitations that are worth noting here, particularly from a methodological standpoint. Online questionnaires are arguably the simplest and most convenient vehicle for reaching a large voluntary sample of relevant respondents virtually; they served as a highly pragmatic approach in data collection particularly during the pandemic. However, a survey based on self-chosen participants might well be susceptible to several potential drawbacks, mostly notably a self-selection bias caused by the fact that the data might overly represent responses from those who decided to take part in the survey due to having strong opinions on the particular research topic being asked. Overcoming this methodological problem will require follow-up studies using other research approaches, such as qualitative data collection based on document analysis, interviews, and focus groups to collect a richer source of information on more granular, often subjective levels.

Additionally, it also will be imperative to conduct follow-up research exploring how the pandemic-induced work arrangements, often improvised without any prior preparation in the early days, will have lasting effects on post-pandemic technical services.²⁰ As colleges and universities return from pandemic-related disruption across the US, much of technical services work will likely revert to pre-pandemic conditions. However, some of the changes instituted during the pandemic could plausibly continue, enabling certain technical services tasks to be optionally performed remotely. One of the key questions for this future research, therefore, is how academic library technical services will incorporate the new ways of working on a sustainable basis after pandemic restrictions are lifted—after carefully evaluating and considering their effects on individual and team productivity. Additionally, it would be interesting to explore how the results of this current study compare with the pandemic experiences of technical services departments in non-academic libraries or those of other academic library units such as public services to identify commonalities and differences in their COVID-19 responses. Furthermore, future research is needed to better understand the causes of the differences that the survey data showed between ARL and non-ARL libraries in such areas as in-person access to library facilities, budgets cuts, and acquisitions formats.

In the wake of the historic public health crisis, another important topic worth exploring is how the COVID-19 experience can affect disaster preparedness in the post-pandemic future. One of the survey's key findings was the overall lack of business continuity plans that would have provided the framework and actionable steps for technical services units to respond to emergencies caused by deadly human pathogens. Humanity has experienced fateful encounters with three similar epidemics just within the last two decades, namely SARS (Severe Acute Respiratory

Syndrome), MERS (Middle East Respiratory Syndrome), and now COVID-19, not to mention even more deadly and contagious viruses like Ebola. The increasing frequency of pandemic risks seems to highlight the importance of developing or updating and informing contingency plans to prepare for continuity of operations in the event of future global health or other crises to achieve long-term organizational resilience.²¹ A study of the types and aspects of contingency plans that proved effective during the current emergency would be highly relevant so that academic library technical services units will be able to apply best practices in disaster planning when the next global crisis occurs.²²

While there are many methodological and future research questions that are worth exploring further, analysis of the survey results above clearly helps provide interested librarians and library managers with a baseline understanding of the pandemic's effects on technical services units in US academic libraries. Daily demands of COVID-19

response led to significant disruptions to normal operations while libraries worked to continue providing core functions and services, now often virtually, for their user communities. Clearly, one might argue that resilience, as revealed in the survey data, was a fundamental characteristic of the response of US academic library technical services to the pandemic. The survey data generally painted a picture of technical services librarians and support staff making determined efforts to continue performing as much of their pre-pandemic work as possible under the challenging circumstances. Obviously, the current study has only scratched the surface of the effects this historic public health crisis had on US academic library technical services units. Future research should collect systematic data for detailing and evaluating how they fared in the historic crisis while also tracking changes to technical services operations and management that have taken place in the aftermath of the pandemic experiences.

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5. One of the authors is currently the head of technical services in a major research library who had the unique mid-pandemic experience of transitioning from the previous position as the head of cataloging and metadata services coordinating a federation of multiple academic libraries; the other author is a cataloging and metadata librarian in a mid-sized college library that had coordinated migration to a new library services platform as interim department head less than a year before the global pandemic took hold on the entire world.
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Appendix: Survey Questions

Q1. Where is your institution located? (Skip to Q2 if “United States” is not selected)

- United States
- Africa
- Asia
- Australia
- Europe
- Canada
- Mexico
- Central/South America
- Other

Q1a. In what state is your institution located?

Q2. Which best describes your institution?

- Doctorate-Granting University
- Master’s College or University
- Baccalaureate 4-Year College or University
- Associates 2-Year College
- Special Focus Institution
- Tribal College
- Non-Academic

Q3. Is your institution public or private?

- Public
- Private

Q4. Is your library an ARL (Association of Research Libraries) member library?

- Yes
- No

Q5. Which best describes your current library management system?

- Cloud-based library services platform (e.g., Alma, WMS)
- Integrated library system (e.g., Aleph, Evergreen, Voyager)
- Other (please)

Q6. Please indicate your primary job function. (Check all that apply)

- Acquisitions
- Cataloging and Metadata

- Digitization and Preservation
- Electronic Resources
- Serials
- Other (please specify)

Q7. What best describes your institution’s approach to offering classes during the COVID-19 pandemic in the fall of 2020?

- All in-person classes have been resumed
- In-person classes moved to online/remote instruction entirely
- Classes are held through a hybrid of in-person and online courses
- Other (please specify)

Q8. What best describes the current status of your on-site library operations for users?

- Library/all libraries open usual hours (Skip to Q10)
- Library/all libraries open but hours are now limited
- Library hours have expanded
- Other (please specify)

Q9. Have your library/libraries ever been designated to stay open in some capacity since the COVID-19 pandemic started because they are considered an “essential service”?

- Yes
- No
- Other (please specify)

Q10. What best describes the current status of access to print materials at your library for users? (Check all that apply)

- Access to print materials continues in person and is only onsite
- Access to print materials is staff mediated and onsite only
- Access to print materials is staff mediated and via delivery
- Access to print materials is staff mediated and via specified offsite pickup location
- Access to print materials is staff mediated and via digital reproduction requests
- Access to print materials has been suspended
- Other (please specify)

Q11. Was there a plan for disaster response/emergency management in place at your library before the COVID-19 pandemic?

- Yes
- No (Skip to Q13)
- Not sure (Skip to Q13)
- Other (please specify)

Q12. How would you rate the usefulness of the pre-existing applicable plan in dealing with a large-scale emergency such as the COVID-19 pandemic?

- Extremely useful
- Somewhat useful
- Neither useful nor useless
- Somewhat useless
- Extremely useless

Q13. Were technical services employees (except student workers) allowed to work remotely in your library before the COVID-19 pandemic started?

- Yes, remote work was allowed for all employees
- Yes, remote work was allowed for some classes of employees. Please specify (e.g., librarians)
- No, remote work was not allowed for any employees
- Other (please specify)

Q14. What best describes the current work arrangement in your technical services unit(s)?

- All employees have been required to work remotely
- Remote work has been allowed for all employees, but some have chosen and are allowed to work in the library
- Some classes of employees have been allowed to work remotely, while others have continued to work in the library
- All employees continue to work in the library (Skip to Q19)
- Other (please specify)

Q15. Has your institution provided computers and/or technology support (e.g., high-speed internet) for employees needing them at home to work remotely?

- Yes, to all employees in need
- Yes, to some employees in need
- No
- Other (please specify)

Q16. What best describes your library's policy on employees lacking access to computers and/or technology support at home for working remotely?

- Employees who cannot work remotely have not been required to work but have been paid
- Employees who cannot work remotely have been required to use vacation/sick time in order to get paid
- Employees who cannot work remotely have not been paid
- Employees who cannot work remotely have been required to work on-site
- Other (please specify)

Q17. For technical services employees in your unit(s) who have been asked to work remotely, please indicate the types of remote work assigned (in percentages adding to 100%).

- Remote work comparable to existing on-site duties (e.g., copy catalogers now handling e-books as opposed to print monographs)
- Remote work different in nature from existing on-site duties (e.g., copy catalogers handling print monographs now working on electronic resources management)
- Database cleanup tasks
- Working on/organizing department documentation
- No remote work available for them
- Regular job duties continued while working remotely
- Other (please specify)

Q18. Have your library management system presented any issues in supporting your remote work arrangements during the COVID-19 pandemic?

- No
- Yes (please specify)

Q19. What best describes the current status of your cataloging department operations?

- Cataloging/processing of physical items has continued as usual (Skip to Q21)
- Some cataloging/processing of physical items has continued while staff have partially shifted to handling more electronic resources
- All cataloging/processing of physical items has been suspended while staff have completely shifted to handling electronic resources
- Don't know
- Other (please specify)

Q20. Please tell us if any practice/workflow adjustments have been made due to the shift to handling electronic resources. (Check all that apply)

- No practice/workflow adjustments needed to be made for staff
- Additional training had to be given to staff to handle e-resources
- Guidelines and procedures for handling electronic resources had to be created anew for remote work
- Existing guidelines and procedures for handling electronic resources had to be revised for remote work.
- Some staff were not equipped or trained to catalog remotely, resulting in a cataloging backlog
- Don't know
- Other (please specify)

Q21 What best describes your library's approach to acquiring new resources in response to the COVID-19 pandemic?

- Has completely shifted to acquiring materials from physical to electronic format
- Has partially shifted to acquiring materials from physical to electronic format but still continues to acquire some print resources
- Continues to purchase print and electronic resources, with no shifts from previously designated budgets
- Don't know
- Other (please specify)

Q22. What best describes your library's budgets situation since the COVID-19 pandemic started?

- Our materials budgets have not been affected
- Our materials budgets have been partially decreased
- Our materials budgets have been completely taken away
- Our materials budgets have been increased to support online learning/teaching/research needs
- Don't know
- Other (please specify)

Q23. What best describes your current acquisitions workflow?

- We have a cloud-based library management system. We continue the normal workflow except it's done remotely.
- We do not have a cloud-based library management system. We continue the normal workflow via VPN access to workstations at work.

- We do not have a cloud-based library management system. With no VPN access to workstations at work, we continue our ordering through vendors' platforms, but order records have not been created in the local integrated library system.
- We do not have a cloud-based library management system. With no VPN access to workstations at work, we have temporarily suspended our acquisitions activities.
- Don't know
- Other (please specify)

Q24. Working remotely during the COVID-19 pandemic has allowed me to . . . (Select from: strongly agree, agree, neither agree nor disagree, disagree, strongly disagree, n/a)

- Have more control over my work environment
- Have more independence
- Save money (e.g., commuting expenses)
- Help with caring responsibilities (child/elder/pet/other)
- Get more work done
- Work with greater concentration
- Stay motivated
- Reduce the stress of commuting to work
- Have more time for myself
- Have more time for my family
- Have more flexibility
- Feel safer than I would have felt working in the office.

Q25. Working remotely during the COVID-19 pandemic has led to . . . (Select from: strongly agree, agree, neither agree nor disagree, disagree, strongly disagree, n/a)

- Loss of professional interaction
- Loss of social interaction
- Reduced mutual learning among employees
- Reduced cooperation among employees
- Lower staff commitment to their organization
- Loss of visibility and career development opportunities
- Reduced motivation to work
- More family conflicts
- Lower work output
- Different work duties