Sustainable Boutique Research Services in a Mid-sized STEM Library: A Preliminary Study

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Abstract

Information seekers' increasing comfort in leveraging research technology has reduced demand for traditional models of reference services, while highlighting the role of expert assistance when navigating complex information needs. Librarians at the Colorado School of Mines (Mines) are exploring how to provide meaningful research support to faculty, postdocs and graduate students on campus while maintaining some aspects of traditional reference services that focus on undergraduates. This study explores the concierge or boutique model that provides individualized, flexible, value-added services within the larger scope of the library. A literature review, internal scan of the Mines institutional context and an outward environmental scan are combined to evaluate feasibility of designing boutique research services in a mid-sized STEM-focused library. Lessons learned in this exploration will influence the design of a pilot program to be implemented in the Mines library.

Introduction

Research and reference services, a staple of university libraries, are changing. Information seekers' increasing comfort in leveraging research technology has reduced demand for traditional models of reference, while highlighting the need for expert assistance navigating complex information needs. The concierge or boutique research service model has emerged over the past decade to address this changing research landscape. This model is defined as the consolidation of library services related to reference, information literacy, scholarly communications, outreach, research data management, and other research support activities, under the leadership of a team of specialists. Flexibility, uniqueness, and personalization of the services offered are inherent in the model.

These changes in the information environment have pushed librarians at the Arthur Lakes Library at the Colorado School of Mines (Mines) to re-think the current model of reference, especially for faculty and graduate researchers. The library plans to build upon the successful aspects of current initiatives and better integrate them with reference services to create a cohesive program. This new model aims to provide specialized in-depth support for research teams, departments, and research centers across campus through consultations, small group instruction sessions, and curated resources. Leveraging staff strengths and current successes will help reallocate resources and identify obsolete services that can be discontinued.

This paper explores models for offering concierge or boutique research services in other libraries and applications to our mid-sized, STEM-focused institution. An in-depth literature review identifies existing programs and best practices of this model in use at other institutions. A two-part environmental scan first looks internally at the research, staff needs and practices at Mines.

Then, it looks outward at other institutions' offerings to better understand the types of initiatives that could be included in the program. This research will ultimately be applied to design, pilot, and assess a concierge program for the Mines library.

Literature Review

A variety of terminology has been used in the past several decades to describe aspects of the services that Mines librarians would like to combine into a concierge program: embedded, reactive, user-centric, personalized, boutique, tailored, liaison, reference, subject librarianship, consultation, etc. A systematic review would be needed to fully explore all the aspects of the services included in the concierge model. For example, a whole body of literature has been dedicated to debates on the staffing and location of the reference desk. The focus of this study, and literature review, is the packaging of assorted services into a single offering by academic libraries. Several factors at the authors' university, including staffing, strategic direction, and identified faculty needs have already eliminated some aspects of the literature from consideration. Specifically, due to staffing issues, the current librarian-staffed reference desk model is no longer feasible at Mines. The library is organized in a functional staffing model, making initiatives that require large numbers of liaison or reference-focused librarians difficult to implement. Therefore, the authors are concentrating this literature review on larger models and issues rather than debates on desk location or staff organization.

At the outset of the project, the authors were interested in exploring libraries using the term "concierge" to describe their services. This portion of the literature uses the term to describe a variety of programs from welcome desks to consolidated service desks to staff training projects [1]–[3]. This term appears to be used broadly, compared to the more narrowly focused terms "embedded" and "boutique." At Oregon State University (OSU), this service most closely resembles that of a hotel concierge [1]. OSU staff from across the library worked at a mobile station positioned near the library's entrance for the first few weeks of each semester. At Stanford University, monthly training sessions have been used to teach library staff members about services and resources across the library and to prepare them to refer users to those most qualified to assist [2]. In both examples, staff across the library are equipped to serve as knowledgeable representatives for the breadth of library services both inside and outside the building. This usage of the term made it less applicable to the Mines context than expected.

In other instances, "concierge" can be used to describe services offered by a particular section of the library, more closely aligning with the authors' goals. The assorted services and skills related to scholarly communications, especially research data management, are a popular choice for a concierge program [4]–[6]. While basic skills and tools are useful across scholarly research, application is highly individualized. Offering a suite of concierge research data management services allows libraries to flexibly support researchers in highly personalized ways, the essence of the concierge model. At Kent State University, Collura et al. modeled an academic research data concierge service. As they describe, "The ultimate goal of the service is to eliminate or reduce potential delays, complications or issues that researchers may encounter at any portion of the research process and research data lifecycle"[4]. Their paper discusses several models from

the University of Central Florida, Colorado State University, and others that they reviewed in developing their service.

Another term used to describe the collection of services is "embedded". This term is often used in the literature related to liaison duties and reference services. It is the most narrowly focused of the terms explored in this literature review. Embedded reference, outreach or librarianship has been described as taking library services to the user or being where users need them to be [7]. This often manifests as office hours in department buildings, material delivery and/or sustained involvement in a course throughout the whole academic term [7], [8].

Of note for this project, some articles discuss embedding in research groups and at points throughout the research lifecycle [9]–[11]. These embedding practices are of special interest to STEM-focused research libraries like Mines. In a newly published study, librarians at the University of Calgary participated in a multi-year examination of the role of librarians in academic research, and found, "One important aspect of collaborating on research with the library is that the library must avoid a 'one-size-fits-all' approach, instead prioritizing openness to exploration and the tailoring of services to the needs of the research" [11]. This sentiment ties directly to concierge model concepts of personalization and flexibility. In 2014, Emily Mackenzie of McGill University reviewed the current literature on embedded offerings for research groups. Based on her research, she found that "Because the needs of each research group will differ, librarians would need to envision an adaptable and flexible approach to providing service that would address their needs not only in a discipline-specific way but provide added value by addressing their group-specific needs" [9]. In another approach that will be of interest to STEM librarians, Shu Lin of Peking University investigated embedding services along the research lifecycle: "Libraries should actively embed library services in scientific research in order to support researchers to find, manage and make good use of scientific data resources, promote scientific development, and ultimately better establish a user-driven library" [10]. All these studies emphasized the need for a flexible approach when responding to researcher needs, particularly in STEM research.

The term "boutique" became popular in the mid-to-late 2000s and at first was used to describe library buildings and spaces, typically newly built public library branches [12]. It is more aligned to a vision or mindset as opposed to describing a specific application like concierge services. In 2010, Andy Priestner and Elizabeth Tilley of Cambridge University popularized the concept of boutique libraries. In 2013, Tilley identifies a key factor of the boutique model, "We must have in-depth knowledge of our users, and allow that knowledge to influence our service, rather than allow procedures to dominate" [13]. It is crucial to constantly evaluate your knowledge and to have a culture of flexible, responsive staff. Other libraries have adopted the boutique model as laid out by Priestner and Tilley [14]–[16]. In a 2013 book chapter, Wendi Kaspar and Gail Macmillan of Texas A&M University describe five aspects of the boutique experience as applied to libraries: quality of experience, homely, uniqueness, personalized and value-added [15]. However, simply changing services is not enough to make a true impact on campus; users must be kept informed about the support available to them. They argue, "value is added to available library resources when library customers know their options and can take advantage of them!"

[15]. In many ways, the literature describing boutique library services most closely aligns with the vision for the research pilot program at Mines. The model emphasizes the flexibility and personalization of the concierge model, while relying on a deep knowledge of local context.

Although the basic concept of concierge or boutique library services is not particularly new, there is a significant gap in the literature on the application of the model in small and mid-sized STEM libraries. Author affiliations and case studies throughout the literature review have been associated with large public universities or well-funded, well-staffed private universities. They typically had multiple, fully dedicated reference and/or liaison librarians who could commit to the project. Across the reviewed literature, authors mentioned that their new project was accompanied by or followed removal of librarians from duty obligations at a static reference desk [3], [7]. However, aspects of the concierge model can be adapted to meet the needs and limitations of small to mid-sized university libraries. Based on the reviewed literature, the most critical considerations for Mines librarians in developing the pilot will be an in-depth understanding of local context, a well-defined vision for the scope of the program and purposeful advertising of the services included.

Environmental Scan

A two-part environmental scan is a necessary step in redesigning the research and reference services at Mines to ensure that this new program meets the needs of the institution. The internal scan looks at current research services, staffing and the research landscape on campus. The external scan identifies similar initiatives at peer institutions that could be adapted or applied to the Mines context. Data was gathered from descriptions and promotional content related to these services available on the peer institutions' websites; information aimed at potential clients.

Internal Scan

A crucial step in evaluating the feasibility of adopting a boutique research service is an analysis of the current initiatives and staffing of the library and research landscape at the Colorado School of Mines. The library is organized using a functional specialist model, in which all librarians are responsible for an area of specialty such as instruction, maps or scholarly communications, instead of having a team of dedicated reference librarians or subject specialists. The library has been organized in the functional model for many years, with nominal liaison responsibility for collection development purposes only. In recent years, there has been growing debate in academic libraries comparing the subject specialist and functional models [8], [11], [17]–[19]. The use of the functional model at Mines has both advantages and disadvantages. The library has utilized staff expertise to support the university more extensively than it could have under a specialist model, offering broader outreach programming and dedicated scholarly communications support. It has also helped the library attract talented librarians who may lack a background in STEM librarianship. These candidates may be enthusiastic about the functional aspects of their work but be less confident applying for a STEM liaison position. Filling STEM specialist positions can be difficult, especially in smaller libraries that lack sufficient funding to be financially competitive for specialist candidates.

However, there are disadvantages to organizing along the functional model. Of the current twelve faculty librarians on staff, five have reference in their job descriptions and five have information literacy instruction duties. The library has less than two FTE equivalent fully dedicated to reference and one FTE equivalent dedicated to instruction. The team leaders in these areas rely heavily on the availability and goodwill of colleagues to staff the reference desk or teach instruction. The library lacks the ability to provide dedicated support to many academic programs on campus. Some librarians have academic background or experience in areas related to geology and engineering (important areas of emphasis at Mines), but there is a lack of expertise in other subjects, such as chemistry, environmental science, and computer science. Expertise tied solely to individuals is not consistent, changing as staff leave or take on new roles. Liaisons and dedicated reference librarians play a significant role in the concierge and boutique work at the libraries explored in the literature review. Mines librarians will have to determine how these activities can be accomplished in a library organized on the functional model.

Mines librarians' responsibilities have changed emphasis significantly over the past 20 years. In 2000, the library maintained the "traditional" services supported for decades with 20 staff and over 60 student employees. These services included reference, circulation, course reserves, interlibrary loan, cataloging, collections management, government publications, maps and computer systems. Other programs were given scant attention due to lack of resources. Today, the library continues to maintain these services, updated and evolved. Although the library now has 22 staff, there are less than half the number of student employees. In addition to traditional services, several significant initiatives have been added: scholarly communications, information literacy instruction, formalized outreach and engagement, virtual reference tools, management of the university's institutional repository, digital archives collections, support for Open Educational Resources, diversity initiatives, and a coffee shop. Most librarians are now responsible for at least 2 major programs or services; the others are impacted by increased workloads and participation in those programs. The library must critically evaluate service offerings to discontinue obsolete practices and services.

A critical aspect to consider before piloting the boutique program is the amount of staff time that could realistically be dedicated to this new initiative. Currently, nine librarians staff the reference desk throughout the week. Most have a single, three- to four-hour shift, except for the STEM reference librarian who staffs evenings and weekends. In fall 2021, after evaluating years of user statistics and query types, librarians piloted and then adopted fully virtual reference services, closing the physical desk. The librarians continue their shifts virtually, using Springshare's LibAnswers with chat; with a welcome level of flexibility to work from either office or home. Fortuitously, this change was almost seamless due to the previous full off-campus service provided by librarians from their homes due to the library closure at the 2020 COVID-19 outbreak. Some librarians are offering "Book a Librarian" appointment availability during their shifts as well. This strategy expands student access to appointment slots while making effective use of the librarian's time on duty. In the proposed boutique pilot program, reference staffing could change significantly. Some librarians who are currently staffing the reference desk have already declined to participate in the boutique pilot program. Because of this, the pilot program could include developing a hybrid level of virtual reference desk staffing, with other librarians

dedicated to boutique services. This combination may provide opportunities to reposition librarians to play to their strengths and increase other forms of interaction.

In addition to reference duty, Mines librarians have other roles that could be included in the pilot program. The Teaching and Learning Librarian leads information literacy instruction efforts that reach 100+ course sections and approximately 2000 students each academic year. The Scholarly Communications librarian is the library's first point of contact for graduate students, offering workshops, consultations, and research group sessions on topics across the research lifecycle. The Outreach and Engagement librarian leads campus-wide outreach initiatives, and under the new model could lead efforts to engage with research groups, centers, or individual departments. The Map & GIS librarian serves as academic outreach coordinator and leads outreach efforts to faculty through cold calls and email communication. Mines librarians are already doing some of the activities identified in the boutique model as described by Kaspar, Priestner, Tilley and others, but without packaging them into a single service. Piloting a boutique program would help Mines librarians to formally organize and better promote the services to researchers across campus. Librarians can then leverage successful programs to reach more researchers on campus.

Another aspect that merits investigation is staff perspectives on the successes and struggles in the current research model. Given the library's added initiatives and their wider impact, staff have expressed frustration with both the previous in-person reference model and the existing virtual model. While staff often expressed value in the face-to-face interactions with students, others view staffing the static desk is a disproportionate waste of time given the dwindling numbers of questions received and the locational/directional nature of many of those questions. Staff have pressing responsibilities which cannot be properly addressed while multi-tasking at the reference desk or anticipating possible interruptions. However, the reference team has received feedback from other staff that the reference desk should be staffed physically with increased hours to ensure that anyone who walks into the building can get a librarian's help. This just-in-case model requires adequate desk staffing and is no longer feasible. Abandoning the physical desk and changing reference duty hours has impacts beyond the librarians who have traditionally staffed the desk. As Scott Pfitzinger at University of Wisconsin-La Crosse found, relocating the desk can have an impact on the number and types of questions received at the circulation desk [20]. Librarians participating in reference and the new boutique services will need to consider the implications of the shift on other areas of the library, particularly circulation.

The Colorado School of Mines is ranked doctoral R1 (very high research activity) by Carnegie Classifications [21]. This classification was upgraded from R2 in February 2022, and the implications of the upgrade will need to be factored into the pilot service design [22]. The university has an endowment of approximately $300 million and was awarded more than $100 million in sponsored research in fiscal year 2021 [23], [24]. The Office of Research Administration lists 37 research centers and industry consortia in the areas of materials and manufacturing, water, biology, energy, and subsurface characterization [25]. Research faculty, postdocs and students working in these centers, along with faculty and graduate students across Mines' 17 degree granting departments and programs would be the target audience for the new boutique service. Mines librarians have a nominal working relationship with some of the entities, through individual contacts and research workshops offered by the Scholarly Communications

librarian. An important aspect of a boutique model pilot will be evaluating researcher needs in these centers and departments in more depth, then ensuring that services offered are flexible enough to meet those needs. The team will also need to consider the scale of the program that can be offered without overburdening limited staffing resources.

Outward Scan

Mines has two lists of peer institutions that are typically used internally for comparison. The first group of 10 institutions represent peer comparisons from the Integrated Postsecondary Education Data System (IPEDS) [26]. The second group of 13 institutions are identified as aspirational peers in preparation for the university's 150th anniversary in 2024. Four institutions appear on both lists: Massachusetts Institute of Technology, California Institute of Technology, Worcester Polytechnic Institute and Rensselaer Polytechnic Institute. Additionally, two aspirational peer institutions, Harvey Mudd University and Olin College of Engineering, were excluded from this outward scan because their library and institution size are poorly analogous to Mines. The peer institutions on these two lists are the priority for an external analysis of the concierge model.

The service offerings of the identified peer institutions were evaluated to determine if they offer any of the elements of concierge or boutique research services. The authors looked for information about specific activities such as tailored instruction, scholarly communications services embedded along the research lifecycle, and other embedded services. A combination of vocabulary cues and specific webpages were sought to determine if a given library is offering concierge-type services (Figure 1). Vocabulary cues are terms in web pages, headers or research guides that describe a given service. Additionally, the authors sought out specific pages to gain a better understanding of library structure and organization, including organization charts and instruction request forms. The focus of the peer library website search was to gain an idea of the scope of services offered, and how they are marketed on different campuses.

Topic	Vocabulary Cues Sought	Specific Webpages Sought
Tailored Instruction	course integrated, instruction, embedded, tutorial, workshop	instruction request form, description of instruction services, research tutorials
Liaison Program	liaison, department contact, personal librarian, subject specialists, subject experts	list of liaisons, research guides organized by liaison, organization chart,
Scholarly Communications	citation management, research data management, data visualization, scholarly impact, evidence synthesis, workshop, Carpentries, Open Access	services along the research lifecycle, description of scholarly communications, data management plan support, publishing support, institutional repository
Reference Services	consultation, specialized support, appointment, research help	consultation booking form, reference help, Ask a Librarian, research desk hours, virtual reference

Figure 1. Vocabulary cues and webpages sought in the external scan of library websites

In addition to features identified on library websites, other university level metrics were sought. In Figure 2, university websites and Carnegie classifications were used to identify basic metrics for comparison to Mines including student enrollment, library staff size and library organizational model (subject liaisons vs functional specialists). Michigan Technological University is the peer that most closely resembles Mines in both institution and library size.

Several initiatives offered by peers stood out as promising to consider incorporating into the boutique pilot project. Case Western Reserve University has a library advisor program in which incoming freshmen are assigned a librarian who keeps them updated on library events and services [27]. Carnegie Mellon University offers an evidence synthesis service to help researchers more comprehensively search the literature and optionally manage such searches as co-authors [28]. Scholarly communications could be a feasible area on which to base the boutique pilot project. Several universities including CalTech and Stanford offer The Carpentries workshops on scholarly communications topics such as research computing and authorship [29], [30]. Other aspirational peer institutions such as Rensselaer and Rice offer specialized support for data visualization [31], [32], a service not currently offered at Mines. Tools, services and instruction in this area can be scaled and tailored to the needs of different groups on campus. Research data management is another aspect of scholarly communications work that can be offered in a boutique approach [4]–[6]. Various library initiatives, especially related to scholarly communications, can be tied to different stages of the research lifecycle, providing an easy way to advertise the boutique services and describe them to researchers. An excellent example of this alignment is the Research Assistance page on the Carnegie Mellon University Libraries website [33]. At each point in the lifecycle, researchers can see where library services and tools can meet their needs. As described in the literature related to concierge and boutique models, library users need to know about your services to be able to use them; good advertising is key [15].

		IPEDS Peers						IPEDS and Aspirational Peers				Aspirational Peers						
	Colorado School of Mines	Georgia Institute of Technology	Michigan Technological University	Missouri University of Science and Technology	New Jersey Institute of Technology	New Mexico Institute of Mining and Technology	South Dakota School of Mines and Technology	California Institute of Technology	Massachusetts Institute of Technology	Rensselaer Polytechnic Institute	Worcester Polytechnic Institute	Carnegie Mellon University	Case Western Reserve University	Johns Hopkins University	Lehigh University	Rice University	Rose-Hulman Institute of Technology	Stanford University
Approximate Student Enrollment (Thousands)	7.2	39.8	6.9	7.2	11.7	1.7	2.4	2.4	11.9	7.6	6.9	15.8	12.1	29.1	7.3	8.2	2.1	18.6
Library Staff	22	93	23	12	28	10	6	43	148	18	20	78	44	160	39	95	4	352
Students Per Library Staff	327	428	300	600	418	170	400	56	80	422	345	203	275	182	187	86	525	53
Tailored Instruction	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Subject Liaisons	No	Yes	No	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Carnegie Classification	R1	R1	R2	R2	R1	M3	M2	R1	R1	R1	R2	R1	R1	R1	R2	R1	SF	R1
Type	Public	Public	Public	Public	Public	Public	Public	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private

Figure 2. IPEDS and Aspiration Peer comparison to Colorado School of Mines

Implications for the Program at Mines

Establishing a boutique research program in the Mines library can be a viable pilot project when considering lessons learned in the literature review, internal environmental scan, and outward scan. Revisiting the hallmarks of the boutique model presented by Kaspar and Macmillan -- quality of experience, homely, uniqueness, personalized and value-added -- provides a foundation to start building around the model [15]. Most importantly, librarians need to consider how the new program can provide a personalized experience that adds value for researchers across campus while maintaining a scale that does not overtax staff capabilities.

It will be important for librarians to pursue the pilot with a strengths-based approach, building around initiatives that are already successful, instead of a deficit-thinking approach that emphasizes the small staff size and large student to staff ratio. Authors have identified several benefits to adapting the current reference services into a boutique research program. The pilot will also leverage the strengths of research initiatives that are already successful at the institution. The instruction program is thriving, especially in first year core courses. Scholarly Communications projects include the highly popular *Modern Researcher 501* workshop series and moderate success engaging with research groups along the research lifecycle. Also, the pilot project can leverage the professional strengths of individual staff. Three librarians who plan to participate in the project have an academic background in STEM and three others have extensive experience working in a STEM library setting. This experience will help the team relate to researchers on campus. Piloting a research program would help Mines librarians to formally organize already successful services and better promote them to researchers across campus.

Some of the interesting initiatives undertaken by peer libraries could be scaled to meet the needs of the Mines community. An easy first step would be to align the pilot offerings to the research lifecycle. This effort would draw on examples from Peking University and Carnegie Mellon University and help librarians to conceptualize the program. This strategy can provide a vehicle for advertising the collection of services to faculty and students on campus. MacKenzie's review of embedding in research groups can also provide guidance to the authors for matching services to the needs of specific groups on campus [9]. After completing an in-depth analysis of research centers and research needs on campus, the authors can identify potential partners for the pilot.

Still, to realistically implement the pilot, participating librarians need to consider potential issues and a few unanswered questions to be faced. First, having a group of liaison or subject specialists to implement initiatives is an important aspect of several of the examples from the literature and external scan. How can this project be accomplished without liaisons? Along with that question, how much staff time can feasibly be dedicated to the services of the pilot project? These questions will need to be answered before any serious work on expansion or even advertising can be addressed. Additionally, participating librarians will need to determine the boundaries to place on the pilot. For example, the library does not have the capacity to dedicate a librarian to mediated searching for a research team conducting a systematic review, but consulting on the review and its search parameters is within the capabilities of the team. As Hickerson's team learned at the University of Calgary, "... there were challenges determining library collaborators' scope of expertise and time capacity to contribute to research projects"[11]. The exact scope and

boundaries of the program will need to be carefully managed to keep the pilot from overwhelming staff resources. Finally, the impact on other portions of the library will need to be carefully considered. How will the new program impact work done by the other functional experts in the library? The team will need to consider obsolete services to be dropped or adapted. Decisions will need to be communicated internally and potential stakeholders in the library, including circulation, will need to be consulted to mitigate negative impacts on their work.

Conclusions

Based on review of the literature, an internal scan and external evaluation, it would be feasible for the Mines library to develop and pilot a boutique research program. Leveraging strengths of existing initiatives, librarians can adapt the current research service to better meet the needs of the campus community and make a greater impact where our expertise can do the most good. Focusing on the boutique features identified by Kaspar and Macmillan--quality of experience, homely, uniqueness, personalized and value-added--the team will be able to craft and advertise the suite of services [15].

Although this preliminary study was able to examine portions of the literature and work of peer institutions, few of the examples are true peers for the size and organization of the Mines library. Most of the example and peer institutions have significantly larger libraries, a more established R1 status and a cadre of liaison librarians. The authors will need to conduct additional research into work done at other types of STEM libraries to best inform the design of the pilot project. These types of institutions and projects include librarians embedded on grants and in research teams, as well as national labs and other specialized STEM libraries. The former group are working on projects Mines librarians would like to include in this boutique service, and the latter are closer in size and organization to our library. Researchers at Mines are also heavily involved in research with industry and labs like the National Renewable Energy Lab (NREL) and learning about library services at those organizations can be valuable to the authors.

In addition to this research, future work on the project will include an in-depth analysis of the research environment at Mines. Individual faculty and students will be consulted to identify gaps in current offerings as well as expectations for the type of support they desire to complete their work. As discussed in the reviewed literature, boutique and concierge services are most successful when the library has an in-depth understanding of user needs and expectations. After this additional research, the team will be ready to gather input from the library staff, identify the suite of prospective services, set boundaries to ensure the service does not exceed staff capacity and, ultimately, pilot the program.

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