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https://doi.org/10.18485/bibliotekar.2020.62.1.3

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mCOBISS - ANYWHERE AND ANYTIME

Abstract: The mCOBISS mobile app was created for different types of mobile devices that run on Android or iOS operating systems. The paper presents the beginnings of app development, the different versions and software updates, statistical data on the current use and our plans for the future. The link to COBISS+ and other modules within the COBISS system is presented along with the app functionality that provides an excellent user experience. One uniform mCOBISS app for all COBISS.XX systems was created in 2019 and sped up and simplified the development, maintenance and distribution. In all COBISS.net countries, the mCOBISS app already runs on Android mobile devices, whereas it is planned in mid-2020 to make it accessible also to all iOS devices.

Keywords: mCOBISS, COBISS, mobile apps, IOS, Android, COBISS+.

Development beginnings

The mCOBISS project¹ started in 2012 when the Institute of Information Science (IZUM) in Maribor applied to a public call for tender for co-financing development projects of e-services and mobile apps for public and private non-profit organisations in 2012–2013 (public tender designation JR ESMA JZNO

Davor Bračko et al., "Projekat mCOBISS kao primjer dobre prakse ostvarivanja ciljeva digitalne agende EU = The mCOBISS project as an example of good practice in implementing the objectives of the Digital Agenda for Europe", Zbornik radova XII međunarodne naučne konferencije 'Informacijska pismenost na zapadnom Balkanu', Juni na Uni, 18-20. juni 2015. godine (Bihać: Kantonalna i univerzitetska biblioteka Bihać, 2015), 155-160.

2012–2013).² The contracting authority and the tenderer of the public tender was the Republic of Slovenia (Ministry for Education, Science, Culture and Sports) and the project was also partially co-funded by the European Union. The goal and the aim of the public tender was to foster the development and provide a larger variety of e-services and mobile apps in various areas of the information society and to implement new technological and development concepts, which would contribute towards the transition to a modern and efficient knowledge society.

The facts at the time: Mobile devices were becoming more popular and more accessible, wireless Internet had an increasingly wider reach, keys were replaced by touchscreens on increasingly smaller screens, people were becoming more mobile, which also applies to the users of the COBISS national library information system. Libraries as a public service provider in the area of culture, education and research provide access to library material, information resources and information, acquired another dimension, which we named Virtual Library³ at the beginning of the app development.



Figure 1: »Retro« home screen of mCOBISS.SR 2016

[&]quot;Javni razpis za sofinanciranje projektov razvoja e-storitev in mobilnih aplikacij za javne in zasebne neprofitne organizacije 2012–2013: JR ESMA JZNO 2012–2013", *Uradni list RS* 53/2012 (13. 7. 2012).

³ Davor Bračko et al., "mCOBISS – Virtualna knjižnica Slovenije na mobilnih napravah", Šolska knjižnica Vol. 23, 2 (2013): 111–117.

Development imperative: We wanted to provide all of the most important functionalities of the COBISS system on mobile devices⁴ and on all mobile platforms, enable better accessibility to e-services within the COBISS system, provide a better and more efficient user experience and ensure a large scale of availability to the widest circle of users.

Goals achieved: User-experience based mobile app on all mobile platforms that enables viewing and searching of material in all libraries simultaneously or separately for the widest range of library service users, information about material availability, reservations, insight into material on loan, loan period renewals, keeping records on desired and/or borrowed material (including reminders for important dates), overview of debts and restrictions, finding the relevant library, information about libraries and library departments, etc.

mCOBISS: from version 1.1 to version 3.2

The mCOBISS mobile app⁵ was initially developed in cooperation with outsourced partners⁶ for the COBISS.SI system. It is an app for mobile devices⁷ that runs on the Android and iOS operating systems. The development dynamics take place in runs/waves, which means that the Android version is developed first as significantly more users use devices that run on this operating system, and after a certain time period a version for iOS is developed.

The EU project (documentation) began in 2013 in Slovenia. The mCOBISS app was then adapted in 2019 for all COBISS.XX systems (i.e. .SI, .AL, .BH, .BG, .MK, .CG, .RS and .SR) within the COBISS.net network. The decision⁸ was made that all systems would be united within one application to make development, maintenance and distribution easier. The development of mCOBISS has sped up significantly and now all users in Slovenia, Albania, Bosnia and Herzegovina, Macedonia, Montenegro, Serbia and the Republic of Srpska can access the library catalogue in their country or any other Balkan country from wherever and whenever they want.

⁴ Boris Šavc, "Mobilna knjižnica", *Monitor* Vol. 23, 10 (2013): 45.

⁵ mCOBISS. Domača spletna stran mobilne aplikacije, https://m.cobiss.si (Accesed 15. 4. 2020).

^{6 &}quot;RSTeam: Brez mobilne aplikacije vas ni na trgu", Računalniške novice Vol. 23, 24 (2018): 28.

Mobile devices (mobile phones, tablets, laptops) run on one of the adapted operation systems and also have wireless Internet access (Wi-Fi).

⁸ Along with this decision, the stand-alone apps for Serbia and Bosnia and Herzegovina were withdrawn. They had been previously available in the app store (market).

Table 1: mCOBISS app content development (by software version)

Year	Version	v 1.X	v 2.X	v 3.X
2013	1.0	mCobiss in Slovenia		
2014 March	1.2	- interface in English - improved app response rate - library department data added - updated material statuses		
2014 October	1.3	- version adapted for iOS		
2015 January	1.4	- user identification based on membership card barcode - e-books supported in My library and search		
2015 May	1.4.1	- member name and surname and membership validity added to - My library mCOBISS.SR and mCOBISS.BH independent apps		
2016 January	2.0		- more than four favourite libraries in My library - several memberships in one library - searching in loan history - master password no longer mandatory	

Year	Version	v 1.X	v 2.X	v 3.X
			- library can be added to Favourites for material search - member name and surname displayed in My library - automatic setup for receiving library notifications - option of deleting several notifications at once	
2016 May	2.2		- membership barcode number display updated to include a secret PIN code	
2017 April	2.3		- sorting option added to My library - display of book covers in search results - display of longer push notifications - Street view added to library details - 3D Touch for iOS	
2017 Sept	2.3.2		- correction regarding the display of push notifications	
2018 April	2.3.5		COBISS.SI-ID set up as the link to the record in COBISS+	
2019 June	3.0			- complete overhaul of graphic interface

Year	Version	v 1.X	v 2.X	v 3.X
2019 June	3.0			- integrated ISBN and ISSN barcode reader - membership details on home screen - synching of mCOBISS user profile and My COBISS profile - creating additional bookshelves - mCOBISS in all COBISS.net countries (Slovene version)
2019 Nov	3.1			- one uniform app for eight countries within COBISS ⁹ system
2020 June	3.2			- adaptation for iOS operating system

The transition to version 3.X was very important. At the time, the mCO-BISS app went through a major change as the graphic interface was completely overhauled. In summer 2019, version 3.0 was released for both iOS and Android. The home (start) screen now displays information from My library, such as borrowed material, reservations, history and membership info. This change sped up the process of loan period renewal six times (estimated number of clicks required before and now). In this version, the synching of My bookshelf and memberships in the My COBISS profile was also added. This means that users can view all their memberships and bookshelves both in COBISS+ and mCOBISS and edit them.

At the end of 2019, the mCOBISS.SR and mCOBISS.BH apps were removed from Google Play and App Store and they can no longer be installed. However, many users still have the old app, which is no longer supported and, as a result, does not work very well. The users were notified that they should install the new version of mCOBISS, however, we cannot uninstall the old version from their devices for them.

Regular updates and intensive testing are required to ensure stable app operation. The testing is done at IZUM. In addition to implementing development milestones, the app also undergoes several smaller functional and aesthetic corrections and bug fixes requested by users. At the same time, we follow the trends set by large companies such as Google and Apple who regularly improve the functionality of their operating systems.

User experience

On the market, the profit made from a service is closely connected to the app use. However, mCOBISS is not a payable app and users can simply download it from GooglePlay or the App Store using their mobile device. Even though the installation and use of mCOBISS is free, we would like to provide a similar user experience as provided by other apps. mCOBISS enables targeted access to information following the principle that users have the right amount of the right information at the right time and always on hand, which means a saving in time, energy and invested means, but also a decrease of information overexposure. For full operation, Internet access is required either via Wi-Fi or mobile data.



Figure 2: Selecting the environment/system

mCOBISS app installation

When installing the mCOBISS app, the first step is to select the relevant system within the COBISS.net family. In all environments, English is supported for foreign users along with the system's official language.

Home screen

mCOBISS has a simple concept; the home screen shows all important information regarding library membership, material on loan, reserved material and loan history. Your profile can contain several memberships at the same time. For each membership, you can select an individual avatar¹⁰ by taking a picture with your mobile device camera or selecting it from the photo gallery. You can



Figure 3: Home screen

In the virtual world, pictures, figure and icons (avatars) are a popular way of representing the user (e.g. a player in a computer game) and his/her position in a computer-simulated environment. A profile picture is selected for easier recognition because we can identify with it and reveal something about ourselves to others. Avatars can be words, two- or three-dimensional, and are our »ID« in social networks and in forums as others are in touch with our avatar and not ourselves in person.

login to your profile via My library or your e-mail address. You can also add your family members' library memberships to your profile (e.g. pre-school children, pupils, grandparents, etc.) so that you can quickly view information on loans, material reservations, etc. on their behalf.

Membership card

The app can also be used as a membership card. For every user, a barcode is generated upon registration, which the librarian at the lending desk can scan using an optical reader.



Figure 4: Membership card

Library info

Nowadays, GPS is almost standard equipment of mobile devices, which was made use of in the mCOBISS app. Navigation to the library (or library department) you wish to visit is activated (particularly useful in an unknown city), in addition to the location on the map and the building in real-view (click the stick man icon in Street view) you will also find important information on

each library and its departments, such as e-mail addresses, telephone numbers and opening times.



Figure 5: Information on library location

My library service

If you have the registration number and password to access the library, the My library service provides access to all your details in the library (material on loan, reservations, memberships, etc.). Once you log in, the initial window provides an overview over library notifications and your outstanding debts. You can view the list of borrowed material and renew its loan period, and view the list of reserved material, for which you can also cancel the reservation.

Searching for material

Searching in the shared database and the local databases of the national COBISS systems is the same as searching in COBISS+, but on a mobile device and a smaller screen. Login is not required for login; if you wish to do anything else, you must log in. You can search in basic mode (Find a book, article, etc.) or in expert mode (Detailed search). In detailed search you can narrow down your search by selecting the library and its branch or department, limit the type of material and select the language. You can search for material by title, author, keywords as well as some other indexed fields, such as publication year, publisher, collection, authorship type code, typology of documents/works, UDC, bibliographic record identification number (COBISS-ID), etc.

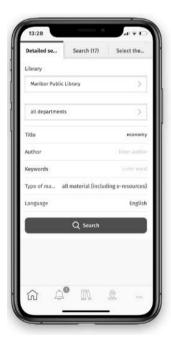


Figure 6: Detailed search

Nina Horvat et al., "COBISS, mCOBIS and the comparison between the two", Design, innovation, participation: 23rd BOBCATSSS Conference (Brno: Flow, 2015), 294–295.

Use of shared database and local databases in Slovenia						
	2015	2016	2017	2018	2019	
- Searches:	19,897,705	19,811,474	19,598,628	29,150,925	41,120,241	
- COBISS/OPAC	17,220,594	16,683,134	10,300,361	1,842,296	710	
- COBISS+			6,597,686	22,666,949	35,425,303	
- mCOBISS	811,298	1,126,691	1,547,097	1,197,019	2,229,206	
- Other services (SRW/SRU, z39.50)	1,865,813	2,001,649	1,153,484	3,444,661	781,640	
- Displayed records:	48,115,320	49,214,812	*44,037,609	*26,653,757	*33,495,228	
- COBISS/OPAC	46,347,710	47,340,113	34,562,786	6,471,783	513	
- COBISS+			7,313,252	16,500,690	23,428,001	
- mCOBISS	649,152	917,581	1,228,042	1,017,804	7,272,283	
- Other services (SRW/SRU, z39.50)	1,118,458	957,118	933,529	2,663,480	2,794,43	

Table 2: Statistical data on the use of bibliographic databases (own source)

My bookshelf

The material you found in the search results can be reserved or stored to your virtual shelf, where it can be reserved later. You can create several bookshelves and give them names to better organise your later work (e.g. Studies, Free Time, Hobbies, Child-raising, etc.) It is important to know the data on My bookshelf is synchronised and everything you place on the shelf will also be visible when you log in to COBISS+ on your computer. The data on the material on your bookshelf can also be shared with others – your fellow students, co-workers, friends, etc.

^{*} The decrease in the number of displayed records does not indicate the actual decrease of the number of displayed records but is a consequence of the migration to other software and, as a result, a different type of record-keeping.



Figure 7: My bookshelf

Push notifications

In your library you can subscribe to receiving notifications on the reservation expiry, received reserved material, upcoming loan period expiry date, overdue notices, membership expiry, outstanding debts. You can select notifications by e-mail, while mobile apps also provide a more advanced notification system, i.e. push notifications. These notifications are sent directly to the mobile device and can be responded to more quickly. For example: if you receive a push notification about a loan period about to expire, you can renew the loan period for this material immediately. If you read a notification on your way home from work that the material you reserved is ready for collection, you can stop at the library and collect the material. The statistics of use show that loan period renewal is the most frequently used functionality of the mCOBISS app.

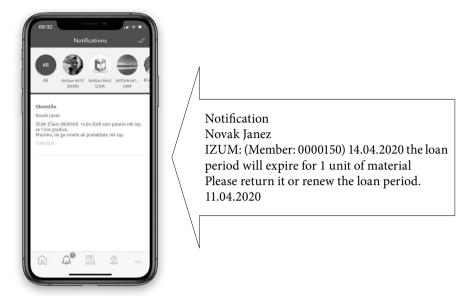


Figure 8: Push notifications

Table 3: Statistical data on loan notifications (own source)

No. of e-notifications about loan, sent to users via the COBISS.SI system central server						
	2015	2016	2017	2018	2019	
- E-mail	3,576,872	4,181,287	4,810,660	4,993,306	5,341,082	
- SMS-notifications	269,136	273,578	273,546	270,065	287,534	
- push notifications	85,712	139,672	267,896	524,897	700,325	

Reservation of material and loan period renewal

You can use the mCOBISS app to reserve material. Once you enter your search request and retrieve the search results, the differently coloured circles will reveal the status of the material (green means that the material is intended for outside loan, orange means it is reading room material). Select the library you are a member of and check which copies are available (green circle) and which ones are already on loan (red circle). You can reserve both available material and material on loan. If the material is already on loan, your reservation will be

placed in the queue, if it is available, you will soon receive a push notification saying that you can collect the material from the library.

After you visit the library where you borrowed the material, you can always check in the mCOBISS app (On loan tab) to see which material you borrowed and when it needs to be returned. If you are subscribed to notifications from the COBISS system, you will always be informed in time that the loan period is about to expire in a few days. You can renew the loan period if the material hasn't been reserved yet. If the loan period already expired, it is no longer possible to renew the loan period.

No. of transactions by users in Slovenia						
	2015	2016	2017	2018	2019	
- loan renewal via:	2,965,460	3,277,824	3,210,353	3,238,388	3,366,920	
- COBISS/OPAC, COBISS+	2,683,802	2,787,686	2,558,496	2,697,589	2,267,055	
- mCOBISS	281,658	490,138	651,857	540,799	1,099,865	
- material reservation via:	778,347	854,053	837,710	857,381	919,194	
- COBISS/OPAC, COBISS+	698,101	725,772	650,086	705,062	641,306	
- mCOBISS	80,166	128,281	187,624	152,319	277,888	

Table 4: Statistical data on loan renewals and reservations (own source)

Scanning ISBN/ISSN barcodes

Mobile devices also have a camera and the mCOBISS app made use of this fact so that you can scan or read the ISBN code from a book in front of us (or the ISSN code off a journal) and start a search in the library holdings¹². The search results are displayed on the screen; the results from the libraries where you are a member will be displayed at the top of the list.

This is the only option that is used in mCOBISS but is not enabled in COBISS+.

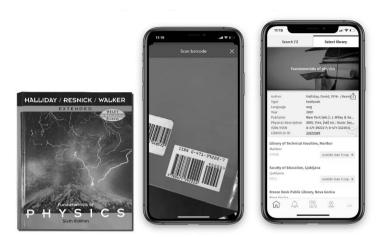


Figure 9: Scanning an ISBN code and corresponding search results

mCOBISS: COBISS+' little brother

The mCOBISS app is embedded in the COBISS system architecture.¹³ The COBISS+ server app enables searching the COBIB shared database and local library databases and also allows searching in other databases (COLIB, CONOR, CORES, JCR, SNIP) as well as the index of scientific and professional e-resources worldwide. The COBIB database also includes links to digital repositories, the OpenURL resolver for linking to full contents and other external services.

The modern COBISS+ application includes two client versions: the COBISS+¹⁴ web application and the mCOBISS mobile app.

¹³ Bojan Štok, Arhitektura sistema COBISS (Maribor: IZUM, December 2019).

¹⁴ Before COBISS+, there was COBISS/OPAC - online public access library catalogue.

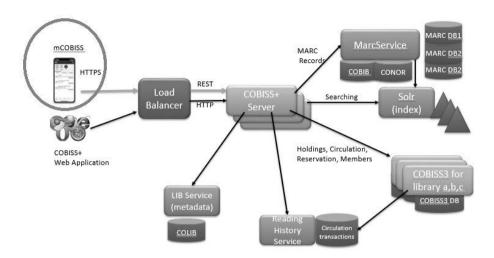


Figure 10: COBISS system architecture (own source)

Both client versions connect via a load balancer to several instances of the COBISS+ server, and the COBISS+ servers then link via MARC servers to the COBIB shared database, the CONOR authority database and the local COMARC databases of the participating countries. For each MARC database, indexes are created in the SOLR server to enable searching in the databases. The My library services in COBISS+ use the COBISS3 services for user authentication, loan overview, loan period renewals, material reservations, etc. All loan transactions (loans, returns, reservations, loan period renewals, library visits) are recorded separately in a special transactions database. COBISS+ uses the Reading History service in order to be able to display the number of loans for each book and the overview of lending history for each library member.

In addition to that, COBISS+ also provides support to personalised user interface settings and permanent saving via the My COBISS profile with the option of logging in with different login identities (e.g. with the login data for your Google+ account), the option of searching in several libraries at once, facet search result limiting, word lemmatisation when searching, auto-complete and automatic suggestions when searching, FRBR support (All editions and translations), online library user registration and priority reservations.

mCOBISS will never be and cannot be as complex as COBISS+ as it was designed for a different purpose and for the times we live in (e.g. the data on the number of available copies in each library is available in real time, which modern users also expect to be the case). In a way, mCOBISS complements and expands

the range of the COBISS+ web application, however, statistical data shows not as much as it was expected when the project was launched.

Data on app use

In order to be able to steer the mCOBISS app development in the right direction, usage indicators are monitored on a regular basis.¹⁵ The trend is similar for all observed years, the »increase« is linear16. Compared to all registered library members, the percentage of those who use the COBISS system e-services via mCOBISS is still quite small.

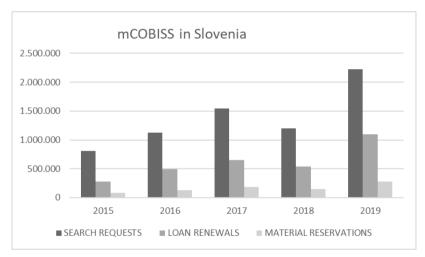


Figure 11: Trend in Slovenia (search requests, loan period renewals and material reservations) (own source)

Moderate use of the mCOBISS app is expected, which is why it is still being promoted on various educational fairs and other events; librarians are trained along with end-users.

¹⁵ Kazalci rasti, https://www.cobiss.si/kazalci/ (Accesed 15. 4. 2020).

On 14 April 2020, the mCOBISS app for Android was installed on just under 40,000 devices and is used by 3500 users daily.

For contrast: At the end of 2019, mCOBISS.SR was installed on just under 800 devices, and COBISS.BH on approximately 200 devices in the same time period.



Figure 12: Trend in Serbia (search requests, loan period renewals and material reservations) (own source)

In Serbia, and similarly also in Bosnia and Herzegovina, the reservation and loan period renewal services are only used sporadically compared to Slovenia.

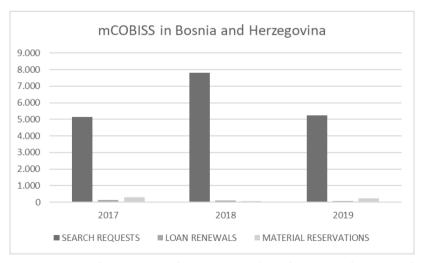


Figure 13: Trend in Bosnia and Herzegovina (search requests, loan period renewals and material reservations) (own source)

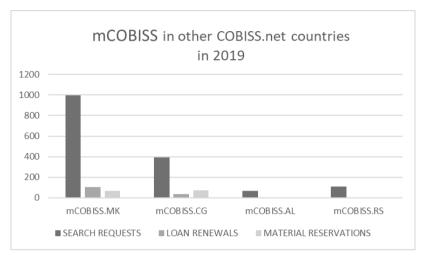


Figure 14: Comparative data for remaining COBISS.net countries (own source)

The data for the last month of 2019, when the universal application was released for all COBISS.net countries, is a result of the fact that the mCOBISS app had not been properly promoted yet in those countries. At the same time, we are aware that it is of key importance to also train librarians on how to use it as they are best promotors of the COBISS system e-services.

Future development

The development of mobile devices and the mobile network has caused a boom in services that force us to be present online all the time. Some of these services are extremely useful while other steal our time. Experience shows that mCOBISS is a very useful and time-saving app.

In summer 2020¹⁷, mCOBISS version 3.2 for iOS devices will be installed in all countries within the COBISS.net network so that the app will be available on both platforms (iOS and Android) in all countries participating in the CO-

¹⁷ It is difficult to define an exact date due to the drastic social changes caused by the COVID-19 global pandemic.

BISS system. Only in Slovenia, better support for borrowing and early returns of e-books via the Biblos system will be added, as the login will automatically be transferred from COBISS to Biblos.

The development of the mCOBISS app has not been completed yet; the development in the world of mobile devices and progressive users encourage us to find and strive towards new and better user solutions or sometimes just personalisation options.¹⁸

References

- 1. Bračko, Davor et al. "mCOBISS Virtualna knjižnica Slovenije na mobilnih napravah". *Šolska knjižnica* Vol 23, 2 (2013): 111–117.
- 2. Bračko, Davor et al. "Projekat mCOBISS kao primjer dobre prakse ostvarivanja ciljeva digitalne agende EU = The mCOBISS project as an example of good practice in implementing the objectives of the Digital Agenda for Europe". *Zbornik radova XII međunarodne naučne konferencije "Informacijska pismenost na zapadnom Balkanu*", *Juni na Uni, 18-20. juni 2015. godine*. Bihać: Kantonalna i univerzitetska biblioteka Bihać, 2015.
- 3. Horvat, Nina et al. "COBISS, mCOBIS and the comparison between the two". *Design, innovation, participation: 23rd BOBCATSSS Conference*. Brno: Flow, 2015.
- 4. "Javni razpis za sofinanciranje projektov razvoja e-storitev in mobilnih aplikacij za javne in zasebne neprofitne organizacije 2012–2013: JR ESMA JZNO 2012–2013". *Uradni list RS* 53/2012 (13. 7. 2012).
- 5. Kazalci rasti. https://www.cobiss.si/kazalci/ (Accesed 15. 4. 2020).
- 6. *mCOBISS. Domača spletna stran mobilne aplikacije* https://m.cobiss.si (Accesed 15. 4. 2020)
- 7. "RSTeam: Brez mobilne aplikacije vas ni na trgu". *Računalniške novice* Vol. 23, 24 (2018): 28.
- 8. Šavc, Boris. "Mobilna knjižnica". Monitor Vol. 23, 10 (2013): 45.
- 9. Štok, Bojan. Arhitektura sistema COBISS. Maribor: IZUM. December 2019.

The latest version of the mCOBISS app will allow users to set their picture as an avatar, which will make the app even more personalised and we hope that the users will embrace it even more. Contrary to social media, other will not be able to see the avatar you set for yourself.

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ИЗУМ – Институт информацијских знаности Марибор

mCOBISS - БИЛО ГДЕ, БИЛО КАДА

Сажетак: Мобилна апликација mCOBISS направљена је за различите мобилне уређаје на којима је инсталиран Андроид и iOS оперативни систем. У чланку представљамо почетке развоја ове апликације, верзије и ажурирања апликације, статистичке податке о тренутној употреби и планове за будућност. Приказујемо и везу са COBISS+ и другим сегментима у COBISS систему, као и функционалности апликације која нуди одлично корисничко искуство. Јединствена апликација mCOBISS за све COBISS системе, која је убрзала и поједноставила развој, одржавање и дистрибуцију, направљена је 2019. године. У свим државама COBISS. пет апликација mCOBISS већ функционише на мобилним уређајима са Андроид оперативним системом, а средином 2020. године планирамо да буде свима доступна и на мобилним уређајима са iOS оперативним системом.

Кључне речи: mCOBISS, COBISS, мобилне апликације, iOS, Андроид, COBISS+.

Текст на енглески превела Петра Бридгес. Сажетак на српски превео Милош Митровић.

> Примљено: 23. априла 2020. Исправке: 4. јуна 2020 Прихваћено: 16. јуна 2020.