Providing Distance Education Without The Internet

DRM and 'Journaline' technologies rise to the challenge

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DRM is the universal, openly-standardized digital broadcasting system for all frequencies from large-area and international coverage using the AM bands (long wave, medium wave, short wave) all the way to local and regional services in the VHF Bands I, II (FM band) and III[1]. DRM is designed to deliver high quality audio and data services for mobile, portable and fixed reception. It allows broadcasters to upgrade their radio offerings to meet the quality and feature expectations of today's and tomorrow's listeners.

DRM is the modern successor technology of the analog radio broadcast standards, AM and FM. It propels radio listening to the 21st century while giving listeners, broadcasters and device manufacturers a wealth of innovation and new business opportunities.

Education Disruption Due To Covid-19

The global Covid-19 pandemic has caused education disruptions in most countries around the world. Many governments have been forced to temporarily close educational institutions in an attempt to contain the pandemic. These nationwide closures have affected more than 90 percent of the world's student population. Many countries rushed to online distance education to ensure continuity of education. However, some 826 million students (50 percent) who have been kept out of schools due to the Covid-19 pandemic, do not have access to a computer; about 706 million (43 percent) lack Internet access, and 56 million live in areas not covered by mobile networks. Many teachers find use of the digital tools a challenge. Additionally, education is hampered by insufficient financial means.[2]

In light of this existing technology divide, governments are setting up, or wish to develop, education services based on mass broadcast media, such as radio, in order to reach greater numbers of listeners; especially the most vulnerable. Radio enjoys wide coverage, and DRM Digital Radio offers revolutionary advantages that can deliver distance education to all.[3]

DRM technology empowers broadcasters to enhance their radio offerings.

This includes as many as three high quality audio programs with additional multimedia/data service on a single transmission. Listeners benefit directly from DRM's additional capacity for audio programs, along with all the new data services such as "Journaline" advanced text, slides show images, and the like. Additionally, DRM receivers can cache and store the data obtained as Journaline text locally on the device, allowing the user to access the information instantly and at any time. This combination of audio and multimedia services available on a standard digital radio set via a free-to-air broadcast service has the potential to tackle the disruption in education posed by Covid-19 pandemic.

Here, we shall take a bird's eye view on the DRM system and particularly focus on the technology features of DRM Digital Radio that enable radio schooling services for education and distance learning.

DRM Transmission Chain Overview

Figure 1 depicts a typical DRM transmission chain that enables the rich digital radio offerings. At the studio end, we have the audio and data sources feeding into the DRM ContentServer. The DRM ContentServer is the head-end system that combines audio encoders, multimedia data management and DRM multiplex generation; essentially a reliable one-box solution to get the DRM content on-air. The ContentServer generates the DRM multiplex signal in standardized MDI
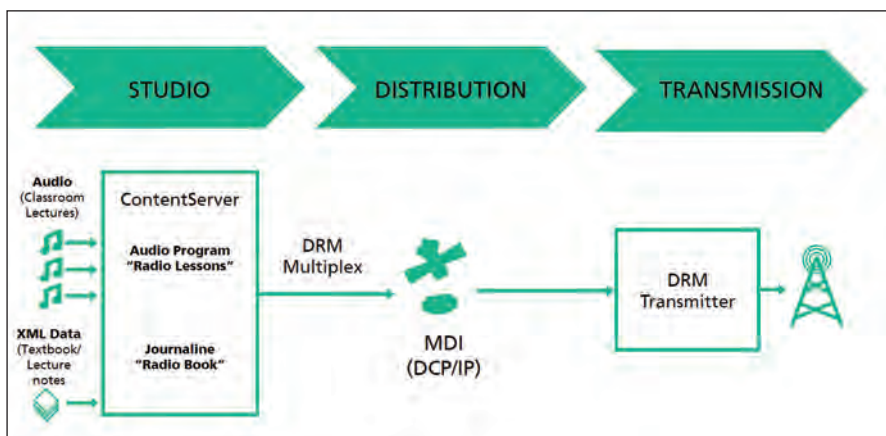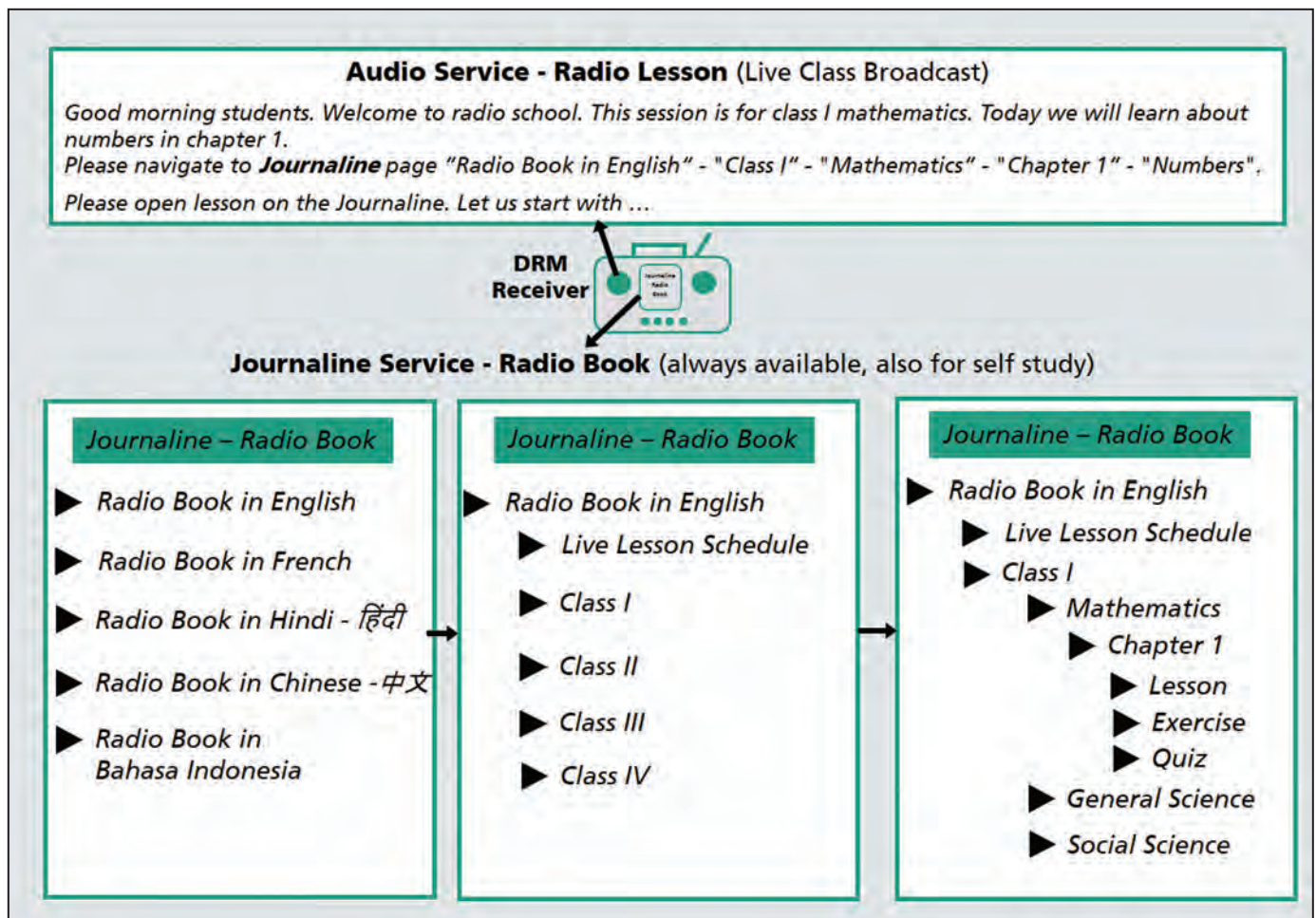

Figure 1.

Figure 2.

(Multiplex Distribution Interface) format. The MDI signal is then provided via Distribution and Communication Protocol (DCP, the modern IP-based studio-transmitter link for DRM) to one or more DRM transmitter sites.

Distance Education Using DRM—Use Case

DRM can deliver the typical classroom education as well as lessons for personal self-study by combining its audio and multimedia service capabilities, as depicted in Figure 1. The DRM audio service carries a teacher's classroom lectures at certain times with a pre-announced schedule ("Radio Lessons"). In parallel, DRM's advanced text application Journaline carries the complimentary lecture notes, full textbooks including graphics and formulas, illustrative images, etc. ("Radio Book"). The complete textbook information is constantly available as part of the DRM transmissions, not just during the live audio lectures; it therefore serves simultaneously as lesson-accompanying lecture notes during a live audio lesson, and as a full textbook for self-study of the subjects by students at any time. The Journaline content can be structured by language, class level, subject, topic and chapters, for easy and instant navigation and content access by the students.

Distance Education Using DRM—User Experience

Figure 2 paints a generic picture of the user experience during a live lesson. The audio service presents the teacher's voice. The teacher will point to specific Journaline chapters during the lesson, equivalent to how they would work with a physical textbook in class.

To prepare for the live lessons, or to self-study at any time, students can access the complete Journaline offering at any time, including additional lecture notes by the teacher for specific live classes, and accompanying quizzes (with answers on separate pages) for students' self-assessment of their learning progress. Other than the live lessons, the Journaline textbook content can be provided in several languages simultaneously: a student could for example access the text version in a regional dialect while the live lesson is provided in a country's official language. This multilingual aspect is particularly relevant for major global broadcasters addressing an international audience.

Thanks to the standardized MDI format containing the full DRM multiplex signal, receivers can easily allow users to record live lessons including all the associated data and signaling components of DRM to a local memory for later access.
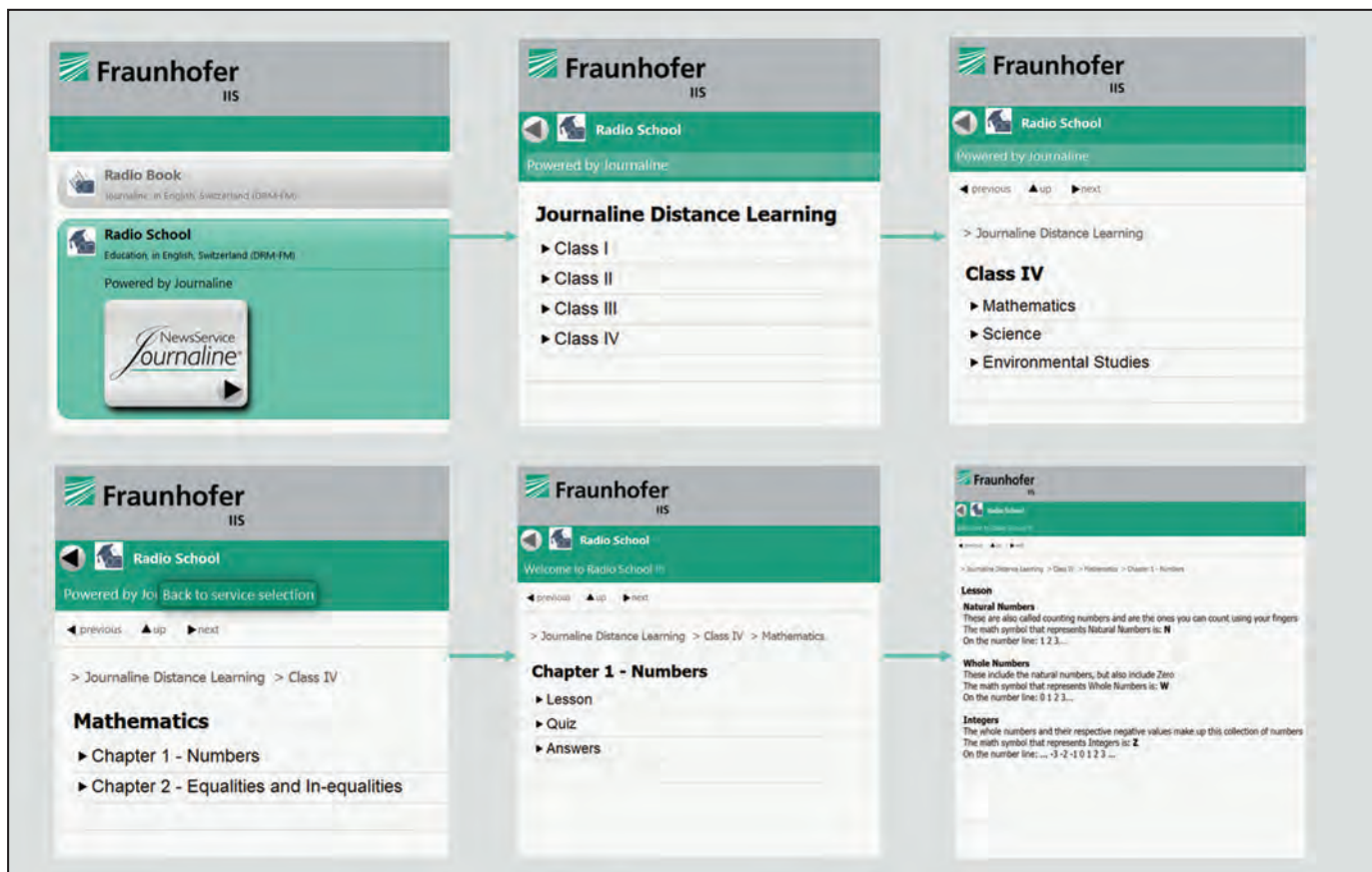
Figure 3.

DRM radio sets that are optimized for the radio schooling use case may provide a built-in WiFi hotspot feature, allowing anybody nearby to access the full content of the DRM lessons—audio and Journaline textbooks—using any device that supports an HTML web browser. This enables the sharing of a single DRM receiver for communities, households or classrooms, and still gives every user full control over navigating the Journaline content at their own pace.

The use case and the user experience depicted in Figure 2 and Figure 3 provide the basis for understanding the technology offering and possibilities of DRM Digital Radio, which reach way beyond classic radio services. Enabling radio schooling and distance education services in the field requires the close cooperation of all stakeholders—from education specialists, professionals in the audio-visual sector, broadcasters, receiver manufacturers, regulators and more. Thanks to DRM, the tools to support and elevate societies even in times of crisis are all available. We just need to make use of them!

References

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About The Authors

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