



Istruzione e cultura

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Brighton
ART
ART RESOURCE AND TECHNOLOGY

**MODEM PROJECT
UK Research Report
Brightonart Ltd.**

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1 Introduction

During this research phase of the MODEM project it is our aim to investigate online communities created to facilitate participation in musical collaboration. The results of the research are presented below. From this research we have proposed a model for the development of MODEM.

1.1 A brief history of online music collaboration

Collaborative music making on the internet has existed since it's inception as a network for information exchange. Some of the first users of the internet were musicians who exchanged sheet music and MIDI files (digital sheet music for synthesisers) via FTP (File Transfer Protocol).

1.1.1 Asynchronous forms

The first internet music collaborations were asynchronous, which means that the artists did not work on the same piece at the same time, but rather worked on part of the work (e.g. lyrics or a MIDI drum track) and sent part to the collaborator(s) for review and inclusion.

By the mid 90s home computers had become powerful enough to allow professional standard editing of audio files (not just the simple note information from MIDI) and a new form of internet collaboration was emerging. Artists could record *live* instruments in their own studio and send the digital audio file to collaborators via the internet. This process mimics the production process that takes place in a conventional studio where several artists record tracks independently that are mixed together by the producer into the finished work. The crucial difference was that now the artists could easily be in different studios around the world without having to wait for a tape or CD to be delivered by courier.

In November 1994 Willy Henshall and Tim Brand formed 'The Res Rocket Surfer Project'. *"The first 'virtual online band' with 1,000 members that communicated through a mailing list and FTP server."*

The Rocket Network was the first commercial asynchronous music collaboration network, developed by the Res Rocket team (see 1.1.2 below) and released in 1999.

1.1.2 Synchronous MIDI

Meanwhile MIDI was still the industry standard protocol for communication between electronic music devices. A typical electronic music studio consisted of a PC running sequencer software connected via MIDI to various synthesisers, drum machines, effects and samplers. The PC sequencer acts as a very precise conductor telling the other machines what to play and when, and the devices audio outputs are mixed together on a mixing desk to produce the final master. At the same time, some musicians were using MIDI to connect their instruments on stage. A drummer would listen to a 'click track' provided by a sequencer on headphones to stay at a constant tempo. At the same time the sequencer would send messages to synthesisers or samplers being used by other artists on stage to synchronise their outputs.

In July 1997 Res Rocket announced the first commercial synchronous music collaboration system for the internet the 'Distributed Realtime Groove Network'.

"Res Rocket Surfer's DRGN was unveiled two weeks ago at the Intel New Music Festival.

For a US\$14.95 monthly subscription fee, users can select between public recording studios, rollicking jam sessions, or MOO-like chats. To play in the studios, musicians must use MIDI instruments or traditional instruments rigged up for MIDI protocol translation.

Inside the studio, each musician, represented by an avatar, can either play along in real time or perfect their part locally and add it to the mix later on."ⁱⁱ

Res Rocket amassed a large number of advocates and despite being incorporated into the worlds favourite sequencer Steinberg's Cubase, it's business model failed and by March 2003 had been shut down.ⁱⁱⁱ

'Rocket Network', Res Rockets asynchronous secure file transfer system bought by DigiDesign became 'DigiDelivery' which is used today by audio professionals to transfer files.

2 Research Results

2.1 Online collaboration today

Although unsuccessful as a business, Res Rocket and the Rocket network had paved the way for online music collaboration for professionals and enthusiasts.

2.1.1 Communities investigated

The online communities included in the research by all the partners were:

MI7 Libraries, IUA Freesound, Waveform.dk, Sounddogs, Ccmixer.org, Jam2Jam, Digital Musician, Artistopia, My Virtual Band, Ninjam, Digidelivery, IUMA, Magnatune, Loopwise, Overplay, Hitsquad.

The observation grid collating the results of the MODEM groups quantitative research of these communities is attached as an appendix.

2.1.2 Asynchronous

Asynchronous collaboration is commonplace amongst audio (and now video) professionals. The high connection speeds available in most parts of Europe allow the rapid movement of large audio files. Audio professionals and enthusiasts can exchange complete project files for different parts of the production process to occur in different countries. Much of this work takes place without a commercial solution, just using freely available email and file transfer systems. There is however a large number of web-sites and online communities aimed at amateur, semi-professional and professional musicians. Some of these aim to foster online collaboration by providing message boards or other community facilities helping musicians to meet online and begin collaborative projects. Others provide a complete solution including facilitated upload and hosting of completed tracks. In addition is the host of sample libraries and special interest groups with assets and information about the myriad of hardware and software musical devices now on the market.

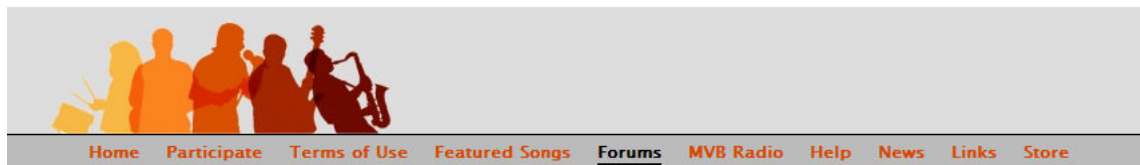
The best thought out of the asynchronous online collaboration communities is MyVirtualBand.com which combines an effective set of communication tools with the specific needs of uploading and downloading musical parts creating a lively community with a high quality output.

2.1.2.1 MyVirtualBand.com

The outstanding feature of My Virtual Band is the well thought out forum and upload system.

The forum is split into 'MVB Projects', where users upload tracks and parts in an ongoing project and 'Member Services' which contains information and discussions relating to the activities of the community.

MVB Forums



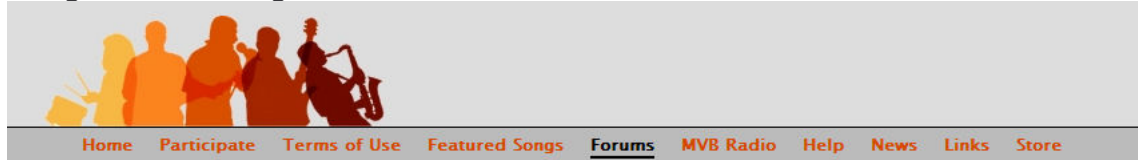
MVB FORUMS

Navigate: Forum List · New Posts · Search · Log In			
MVB Projects	Threads	Posts	Last Post
One Original Track Post MVB Projects with one original track here.	171	2634	April 16, 2006 11:13PM
Two Original Tracks Post MVB Projects with two original tracks here.	48	873	April 16, 2006 09:43PM
Three Original Tracks Post MVB Projects with three original tracks here.	49	910	April 17, 2006 05:06PM
Four or More Original Tracks Post MVB Projects with four or more original tracks here.	116	1547	April 17, 2006 07:47AM
Original Lyrics Post MVB Projects with just original lyrics here.	58	528	April 12, 2006 04:46PM
Member Services	Threads	Posts	Last Post
Announcements MVB announcements from senecal and mason.	19	78	April 10, 2006 05:08AM
Comments and Suggestions Post your MVB-specific comments and suggestions here.	49	461	March 16, 2006 03:11PM
Member Information Introduce yourself and post your equipment specs.	134	717	April 13, 2006 07:36PM
Recording Techniques Tips, tricks and discussion.	37	257	April 10, 2006 01:19AM
The Virtual Lounge Discuss general music and internet related topics here.	71	489	April 12, 2006 02:10PM
Troubleshooting Have a problem? Post it here.	13	56	March 25, 2006 01:00AM
Online MVB Members (Administrator)			
crazyALEX, senecal			
Guests: 2			

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The project forums are split according to how many original tracks exist in the project initially – a good measure of how complete it already is.

Songs with one original track



MVB FORUMS

Navigate: Forum List · New Posts · New Topic · Search · Log In			
Current Page: 1 of 3		Goto Page: 1 2 3 Next	
Subject	Posts	Started By	Last Post
▶ Announcement:Happy Holidays and Mini-Pledge Drive	1	mason	12/21/05 01:06AM Last Post by mason
▶ acoustic blues would benefit from drums Goto Page: 1, 2	19	tatocaster	04/16/06 11:13PM Last Post by GTRman4040
▶ Jodi Big Hair Goto Page: 1, 2, 3	30	moydog	04/16/06 09:29PM Last Post by moydog
▶ Monkeys – Needs : female vocals + rapper + turntablist Goto Page: 1, 2, 3, 4, 5	46	joe soap	04/16/06 09:24PM Last Post by moydog
▶ Please Play it, Try it, I m a Newcomer!	3	aCupofTee	04/15/06 06:02PM Last Post by aCupofTee
▶ Please Play it, Try it, I m a Newcomer! 3	1	aCupofTee	04/15/06 05:59PM Last Post by aCupofTee
▶ Please Play it, Try it, I m a Newcomer!	1	aCupofTee	04/15/06 05:55PM Last Post by aCupofTee
▶ Think Goto Page: 1, 2	12	crazyALEX	04/15/06 01:00PM Last Post by crazyALEX
▶ Blue Fortune – needs guitar lead or anything in good taste (beware, 9/8 section, hehe)	6	GaspY Conana	04/15/06 08:30AM Last Post by hernady

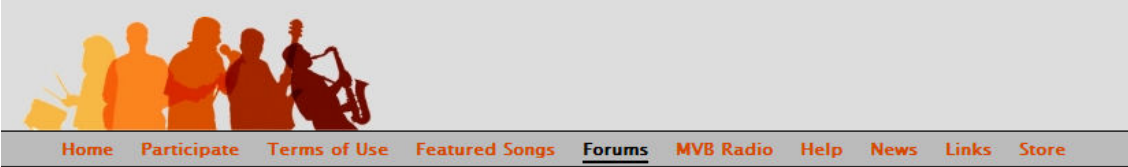
Users post up an audio file, with one or more instrument and vocal parts recorded on it, and invite other users to contribute to the project.

Others post up contributions as separate tracks and as a mix. These contributions are discussed and parts may or may not be incorporated by the originating author, who acts as a manager for the project.

Some originating tracks end up as part of a completed project, many do not and languish unused on the server.

There are enough users and traffic on MVB to keep a regular turnover of finished projects with a hard core of regular users generating most of the work (just like any community).

An example project beginning



MVB FORUMS

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Current Page: 1 of 3 **Goto Page:** [1](#) [2](#) [3](#) [Next](#)

square-roots – the guitar file
 Posted by: [hernady](#) (IP Logged)
 Date: March 29, 2006 05:03PM

hi, a track called 'square-roots', this one has guitar only yet; drums, bass, or solos are welcome:

[\[▶ hernady/square-roots.mp3\]](#) Licensed under the [CC Attr 2.0 License](#)


Cheers
 b

Options: [Reply To This Message](#) · [Quote This Message](#) · [Report This Message](#)

Re: square-roots – the guitar file
 Posted by: [hockinfinger](#) (IP Logged)
 Date: March 29, 2006 08:33PM

Neat-o. I have a short clip of how I felt this, to include some squares (square waves, that is) of my own. Let me know how it flies.

[\[▶ hernady/square-roots_marty_testgroove.mp3\]](#) Licensed under the [CC Attr 2.0 License](#)




President, Southeastern Anarchy Club
 Click me!

Options: [Reply To This Message](#) · [Quote This Message](#) · [Report This Message](#)

Re: square-roots – the guitar file
 Posted by: [neticous](#) (IP Logged)
 Date: March 30, 2006 12:55AM

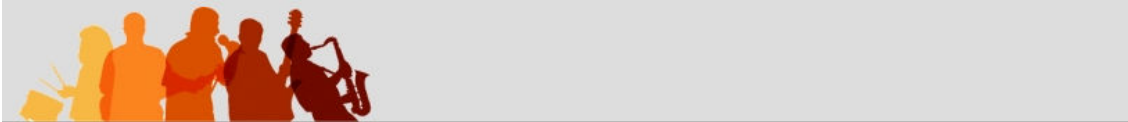
Well that feels cool.
 Very nice Balazs.
 Marty nice groove.
 I just started to sing to it.
 I don't sing much so you get what you get.

Mix:
[\[▶ hernady/SquareRoot-Pete-Test-Vocal.mp3\]](#) Licensed under the [CC Attr 2.0 License](#)



Pete

Finished projects are posted on the featured songs page.



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Posted by senecal on 02/28/06 [Leave Feedback for the Band! \(5\)](#)

January Day

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Posted by senecal on 02/18/06 [Leave Feedback for the Band! \(7\)](#)

Go

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2.1.3 Synchronous

The speed of modern computers and domestic internet connections is such that synchronous audio collaboration is now available to all. There have been various attempts at creating usable synchronous systems since the demise of Rocket, but today there are two successful services, Ninjam and DigitalMusician.net. Ninjam is a free service and provides the synchronous real-time (of sorts...) jamming experience only, with a little in the way of community support. DMN on the other hand is a lively community with a wealth of information, message boards etc. and although it has a free account, for the full quality version a subscription is required.

2.1.4 The situation in the UK

The internet is famous for blurring national boundaries. As English is the predominating language of the internet, most of the online communities are accessible to British users. British internet users, particularly those familiar enough with computers and computer music are unlikely to differentiate

between a British based website or and American one, or a German one in English. The users of music collaboration sites may be from anywhere in the world and this is part of their appeal.

3 The Model

The basis of our proposal is to create a website that incorporates the required features for the model to be useful, while achieving this within the budget and time constraints of the project.

In order to achieve this it is important to utilise existing solutions as far as possible within the project. MODEM should not be reinventing the wheel! The approach should be to first try and establish or develop relationships with the organisations that have already implemented the tools and components required for MODEM and then to assimilate them into the project website.

If one of the components cannot be implemented in this way then another solution should be sought, either adapting an existing open-source solution to fit or as a last resort developing the component from scratch.

3.1 Requirements

The idea behind the MODEM project is to provide a service to facilitate collaboration between young musicians across Europe. Modern music making methods use computers extensively and once these computers are connected via the internet, meaningful collaboration can take place.

The minimum requirements for computer based music production are:

- Standard Computer (Desktop or Notebook).
- Monitor speakers and amp / headphones.
- Music Production Software.
- Musical assets for production including samples, virtual instrument patches, midi files, lyric sheets etc.

Each musician wishing to collaborate with other musicians via the internet would need in addition:

- Internet connection – preferably broadband

Other desirable equipment would be:

- MIDI keyboard and/or other MIDI controller
- Acoustic musical instrument(s)
- Microphones, mixing desk
- Outboard FX

3.2 How can MODEM help musicians produce music?

In order to facilitate collaboration the MODEM website should include tools and assets to help musicians create musical works with their own equipment. The areas where MODEM could supply assistance would be:

- Samples and sound files for inclusion in the musicians works
- MIDI files, lyrics, virtual instrument patches
- A knowledge base of information related to computer music production and online collaboration

All of these things are available online anyway, some free, some paid for. MODEM should provide a gateway to allow users to quickly and accurately access the best information and assets available.

3.3 How can MODEM help musicians collaborate?

Musical collaboration via the internet can take one of two forms, asynchronous and synchronous collaboration.

3.3.1 Asynchronous

Asynchronous means that the musicians work on parts of the finished work in their own time. The individual artists work is assembled or 'mixed' at the end of the production process to form the finished work. A good example of an existing website facilitating asynchronous collaboration is www.myvirtualband.com

3.3.2 Synchronous

Synchronous means that the artists play together in real-time or 'jam' live on the internet as though they were a group playing together in a studio or garage somewhere.

There are two subtypes of synchronous collaboration, audio and meta-data. Synchronous audio collaboration means that the audio output from each participating machine is assembled by a central server and rebroadcast to the participants. Meta-data collaboration is the transmission of MIDI data (or other musical representation) which is converted into audio by the client machines.

An example of a synchronous audio collaborative system is www.ninjam.com

Both asynchronous and synchronous collaboration depend entirely on effective communication between the participants for good results. It is for this reason that the set of communication tools provided by MODEM is probably its most important component.

To facilitate collaboration MODEM could provide:

- Communication tools
- Asynchronous collaboration system
- Synchronous collaboration system

3.3.3 Asynchronous vs. Synchronous

3.3.3.1 Advantages of asynchronous collaboration:

- Independent working. Participants do not have to be available at the same time.
- High quality production. Music produced with computers is often produced asynchronously. Artists have the time to perfect each part of the production often leading to a cleaner, tighter and more professional sound.

3.3.3.2 Disadvantages of asynchronous collaboration:

- Client bandwidth. Asynchronous production does not require a high bandwidth connection for the musician's computer. Parts of the work just take longer to upload, and this is only a small proportion of the production time.
- Time and Organisation. A single work can take many weeks to produce and many may never see completion. Finalisation often takes a high degree of motivation and organisation.
- Storage and server bandwidth. Musical assets soon occupy a large amount of storage space. If many groups collaborating each upload many versions of parts of works and finished works the server storage and bandwidth requirements could be very high.

3.3.3.3 Advantages of synchronous collaboration:

- Live feel. There is no substitute for actually playing live in real-time (jamming) with other musicians. Jamming creates a bond between people that is unique to music and encourages cross-cultural exchange and understanding.
- Instant results. Musicians benefit immediately from the collaboration and recordings can be taken for dissemination purposes.

3.3.3.4 Disadvantages of synchronous collaboration:

- High technology requirement. Synchronous audio means high bandwidth and processing. Four musicians collaborating synchronously would require the server to receive four simultaneous audio streams from the internet and serve four simultaneous streams to the participant's machines. Multiplied by a lot of groups collaborating the bandwidth and processing requirement could quickly become prohibitive. Synchronous meta-data is much less demanding of bandwidth and processor speed.
- Time delay. Synchronous collaboration can never be truly real-time as the data takes time to travel to and from the server. Typical solutions delay the audio stream from each participant by a musical measure so each musician down the line hears the 'mix' one measure later than the last musician. This tends to lead to aimless composition and endless meandering music. It would take considerable practice and good communication, even more than when the musicians are in the same room, to make exciting and dynamic music using this system.

3.4 Communication – the vital ingredient

It is perfectly possible to collaborate to produce music via the internet using none of the specialised tools or websites at all. Musicians have been exchanging musical assets using standard protocols such as email and FTP ever since the inception of the web. The challenge for MODEM is to pull together a useful set of tools and facilities from existing solutions and knit them together in a useful and meaningful way.

All effective collaboration boils down to one thing – communication. If the participants communicate effectively and easily then the work has the best chance of being finished, being high quality and being an enjoyable and rewarding experience for the all involved.

For this reason communication tools should be the first priority for the MODEM model.

3.4.1 Communication tools

The most important aspect is providing an online space where musicians can meet, discuss a potential collaboration and arrange the ongoing work once it starts. Once musicians have made contact and exchanged details traditional communication methods such as telephone may be used in addition to online communication.

All the existing online collaboration services feature built-in communication tools of various types. If suitable partnerships can be made with the organisations that manage these services then it may be unnecessary and even undesirable to repeat the work done.

For example, if collaboration proves possible with www.myvirtualband.com, this service has a well designed and effective forum for users and it would serve no purpose to attempt to design and implement another with limited funds and time.

Online communication tools – most important first

- Forum/Bulletin board
- Chat
- Email
- Voice over IP
- Blog

3.5 Knowledge base

Music production on computers is a skilled and technical discipline that requires an understanding of the technology and the theory of music as well as skill and talent. There is a vast wealth of information on and off line that would be of use to musicians involved in collaboration. The knowledge base has three main sections.

- Web links
- Reproduced articles and tutorials
- Specially produced articles and tutorials

The web links would be an index of useful information already online to help musicians using MODEM to make music and participate in online collaboration. The MODEM partners would research the available information to provide the links, which will be categorised in a useful and meaningful way.

The partners may have access to or be aware of useful articles or information not currently available online which could be repurposed for the MODEM knowledge base with low cost and time implications.

In addition to the online help pages for users of the MODEM web service, the partners should produce a series of in-depth tutorials or guides for online musical collaboration specifically using the MODEM service. These guides will be available online as web pages or printable PDF documents.

3.6 Asset libraries

In order to facilitate collaboration the MODEM website should make available assets to help musicians create musical works with their own equipment.

- Samples or sound files in open and proprietary formats
- MIDI files
- lyrics
- virtual instrument patches
- sheet music
- free software and plugins

All of these things are available online anyway, some free, some paid for. MODEM should provide a gateway to allow users to quickly and accurately access the best information and assets available.

Since two of the MODEM partners already implement sample libraries (Freesound and MI7 Libraries) making a wide range of quality samples available should be straight forward.

Research will be done into other similar repositories of assets in other categories for linking to or making available within MODEM.

3.7 Collaboration Systems

The main functional area of the MODEM model will be the system provided to facilitate collaboration. This system should be based around an asynchronous model of collaboration. Ideally a synchronous system would also be provided within the model as an enhancement to the main functionality.

The reasons for choosing an asynchronous system for the primary collaborative method are:

- The end results are much better, particularly for inexperienced musicians
- Bandwidth and other technology requirements are less for users.
- The choice of production software is completely up to individual users
- Modern electronic music production is typically asynchronous.
- The server technology is much simpler to implement with standard tools.

The ideal situation would be to develop a partnership with one (or more) of the existing services to provide an adapted and idealised solution for MODEM, maybe simply by co-branding, providing low cost or free access or other

partnerships. www.myvirtualband.com is an obvious choice as it provides many of the features that are desirable in such a system. MyVirtualBand has a simple but effective forum based communication and community system and a healthy community of users.

A previous study of online collaboration tools by Larry King^{iv} of Baltimore University reaches similar conclusions.

The MODEM website could also host or link to a synchronous system such as Digitalmusician or Ninjam. Users could be encouraged to participate in both systems and develop works using the synchronous tool to jam compositions and the asynchronous tools to finalise production.

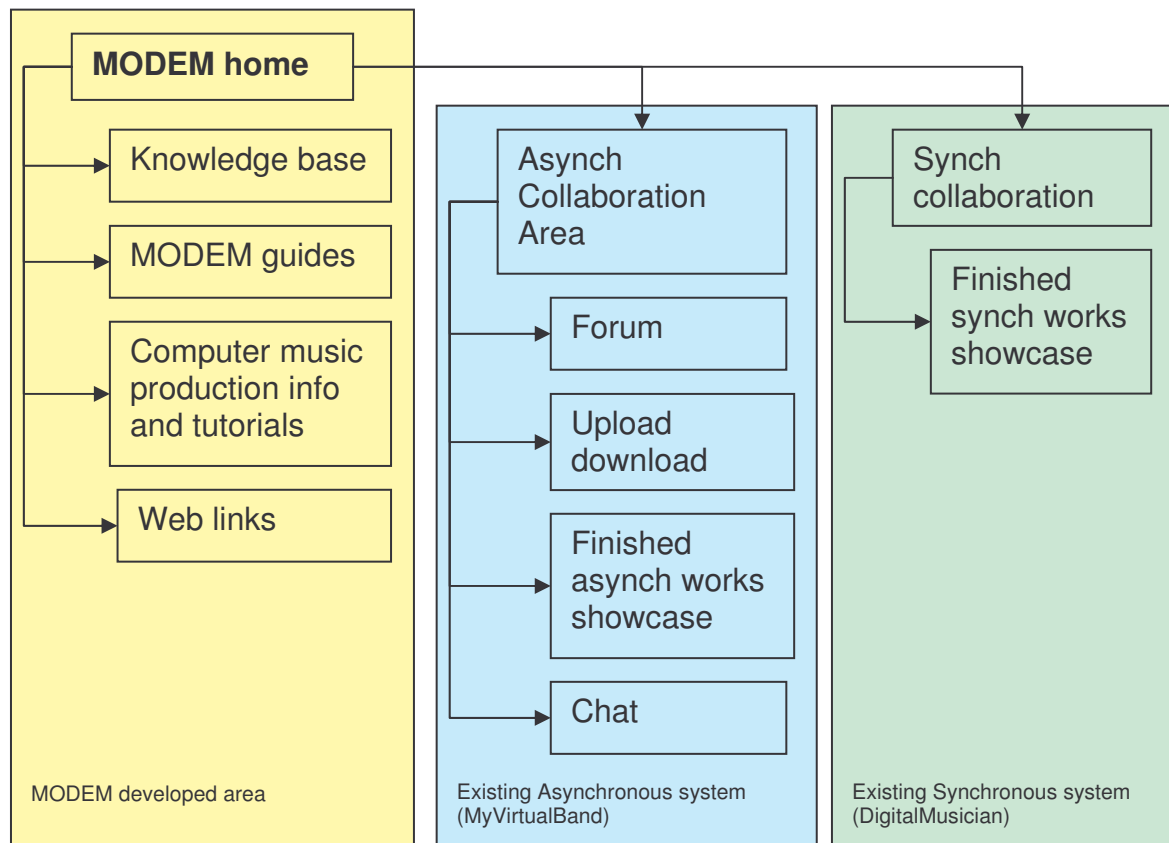
3.8 Rights management

The question of copyright and publishing rights for collaborative music production can quickly get confusing and complicated.

MyVirtualBand and Ninjam deal with the issue by using a Creative Commons licence (<http://creativecommons.org>) which uses the principle of 'copyleft' to make works and their derivatives public domain.

Users of the MODEM system are likely to benefit from an open rights system. It encourages collaboration and participation and their works are unlikely to have value or need protecting from copying anyhow. If online collaborators wish to work on a project that they don't want to be public domain they can easily exchange files via traditional secure means away from the operations of the community.

3.9 Schematic of proposed components of model



4 Conclusion

The partners in the MODEM project have a wide range skills and contacts which could be successfully utilised in the project.

It is our opinion that trying to develop an entirely new set of tools is totally inappropriate.

By leveraging the best of the existing online collaboration services available and providing a well designed set of tutorials and educational material, MODEM can make online music collaboration a new source of enjoyment and learning for young people in Europe.

-
- ⁱ http://www.jamwith.us/about_us/rocket_history.shtml
 - ⁱⁱ http://www.jamwith.us/about_us/rocket_history.shtml
 - ⁱⁱⁱ <http://www.prosoundnews.com/stories/2003/march/0311.1.shtml>
 - ^{iv} http://student-iat.ubalt.edu/classes/king/idia620/KingLarry_idia620_reserachPaper.doc