

# PROJECT DELIVERABLE REPORT



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PP	Restricted to other programme participants (including the Commission Services)	
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Yes, during the design of the software. Please, see the relevant deliverables.	

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<b>Abstract (10-20 lines) summarising the content and results presented in the deliverable:</b>
<p>JamMo version 1.0 is an application that enables children to get, play, manage and make music. It has two version, first is targeted at 3-6 years children and implements singing and composing games. Another version is targeted at 7-12 years children.</p> <p>This document describes briefly how to get and install the application. In addition, instructions how to fetch and build the original source code are given. This document also introduces the official web pages of the JamMo application and gives an overview of the development efforts in the form of source code statistics. Finally, the list of all individuals that have participated in the development and the software license used to distribute JamMo is included.</p> <p>The main contribution in the <i>D7.1 Published Open Source Software</i> is the JamMo application itself and its source code available separately as described here.</p>

## Contents

1 Introduction.....	4
2 Binary packages.....	5
2.1 Installing into a Nokia N900 mobile device.....	5
2.2 Installing into a desktop Linux computer.....	5
3 Source code.....	6
3.1 Downloading.....	6
3.2 Related libraries.....	6
3.3 Compiling for a Nokia N900 mobile device.....	6
3.4 Compiling for a desktop Linux computer (JamMo and all libraries).....	7
4 Web pages.....	9
5 Statistics.....	10
6 Authors.....	11
6.1 Software developers.....	11
6.2 Other contributors.....	12
7 License.....	13
7.1 Terms and conditions for copying, distribution and modification.....	13

## **1 Introduction**

This document describes briefly how to get the *D7.1 Published Open Source Software*. JamMo version 1.0 is an application that enables children to get, play, manage and make music. It has two versions, first is targeted at 3-6 years children and implements singing and composing games. Another version is targeted at 7-12 years children.

Chapter 2 is for ordinary end-users that need an installable application package, and Chapter 3 is for developers requiring the original source code. Chapter 4 introduces the official web pages of the JamMo application, and Chapter 5 gives an overview of the development efforts in the form of source code statistics. In addition, Chapter 6 lists all individuals that have participated in the development, and Chapter 7 describes the software license.

## 2 Binary packages

This chapter describes how to install JamMo version 1.0 into a Nokia N900 mobile device or into a desktop PC running Ubuntu Linux operating system. It is the recommended way for ordinary users to get JamMo.

### 2.1 *Installing into a Nokia N900 mobile device*

JamMo version 1.0 is available at maemo.org Extras-devel application repository (<http://wiki.maemo.org/Extras-devel>). The repository is meant for latest development versions of Maemo applications. JamMo is located in the “Education” section of the repository. It can be installed simply through the device's Application Manager.

To activate Extras-devel one has to perform the following steps: 1) Launch the Application Manager, 2) Navigate to the application menu (tap the title bar), 3) Select “Application catalogs”, 4) Select “New”, 5) Enter a catalog name of “Maemo extras-devel”, 6) Enter a web address of “<http://repository.maemo.org/extras-devel>”, 7) Enter a distribution of “fremantle” (note that “fremantle” has only one 'e'), 8) Enter components of “free non-free”, and finally 9) Select ‘Save’.

JamMo version 1.0 will be promoted into the official maemo.org Extras application repository soon after the D7.1 release (<http://wiki.maemo.org/Extras>). That makes easier also for ordinary users to install the application through the Application Manager without additional steps, because the repository is pre-configured in the N900 device.

### 2.2 *Installing into a desktop Linux computer*

JamMo version 1.0 can be installed into a desktop Linux computer also. Any 32 bit Debian-based Linux, such as Ubuntu, can use the same Extras-devel repository that is used with Nokia N900.

Add the following line into /etc/apt/sources.list file:

```
deb http://repository.maemo.org/extras-devel/ fremantle free
```

You can do it, for example, with the following command:

```
sudo apt-add-repository "deb http://repository.maemo.org/extras-devel/ fremantle free"
```

Then update the package list and install preferred jammo packages. You can achieve that, for example, with the following commands:

```
sudo apt-get update ; sudo apt-get install jammo3-6-en jammo7-12-en
```

### 3 Source code

This chapter describes how to fetch the version 1.0 of the JamMo source code, install related libraries, and compile it.

#### 3.1 Downloading

The source code can be downloaded from several locations. The git version control system in Gitorious is the official one. Other places have a snapshot of the version 1.0 (D7.1) release.

The source code of JamMo version 1.0 can be downloaded as an tar.gz archive filed using the following URL:

<http://gitorious.org/jammo/jammo/archive-tarball/v1.0.0>

The source code can be also browsed on-line. In that case the web address is:

<http://gitorious.org/jammo/jammo/trees/v1.0.0>

Additionally, the debian source package that is used to generate the binary package is available at maemo.org Extras-devel:

[http://repository.maemo.org/extras-devel/pool/fremantle/free/source/j/jammo/jammo\\_1.0.0.tar.gz](http://repository.maemo.org/extras-devel/pool/fremantle/free/source/j/jammo/jammo_1.0.0.tar.gz)

#### 3.2 Related libraries

Before JamMo can be built from source code, the following external prerequisites has to be fulfilled by installing a development package of the depended library:

**GStreamer** is an open source multimedia framework for constructing graphs of media-handling components. The applications it supports range from simple Ogg/Vorbis playback, audio/video streaming to complex audio (mixing) and video (non-linear editing) processing. (<http://www.gstreamer.net>)

**Clutter** is an open source software library for creating fast, visually rich, portable and animated graphical user interfaces. It uses OpenGL (and optionally OpenGL|ES for use on Mobile and embedded platforms) for rendering but with an API which hides the underlying GL complexity from the developer. (<http://www.clutter-project.org>)

**Tangle Toolkit** is a graphical widget library that is based on the Clutter. It provides many high-level user interface elements that are not available in the Clutter. (<http://gitorious.org/tangle>)

**Peerhood** is a Peer-to-Peer neighbourhood, which provides a unified interface to different wireless technologies. PeerHood is constantly sensing the wireless neighbourhood for other devices and services, and offers the list of these devices and services to PeerHood enabled applications. (<https://gitorious.org/jammo/jammo/trees/master/docs/manuals/gems>)

#### 3.3 Compiling for a Nokia N900 mobile device

To compile JamMo for a Maemo device, you need fully installed Maemo 5 Fremantle SDK. These instructions suppose that you are using an Ubuntu in your development machine and Scratchbox2 (sb2) as a cross-compiling environment. Refer to the Maemo SDK documentation for installing and using it. Please, note that you need also closed source 3D libraries provided by Nokia as part of the Maemo SDK.

1) Install the required tools:

```
sudo apt-get install --assume-yes git-core automake pkg-config gtk-doc-tools
```

2) Enable extras-devel repository to be used inside the cross-compiling environment:

```
echo 'deb http://repository.maemo.org/extras-devel/ fremantle free non-free' \  
>> ~/.maemo-sdk/rootstraps/armel/fremantle5.0minimal_armel/etc/apt/sources.list
```

3) Update the package list:

```
sb2 -eR apt-get update
```

4) Install the required libraries and their development files:

```
sb2 -eR apt-get install libgtk2.0-dev libgstreamer0.10-dev \  
  libjson-glib-dev libsndfile-dev libssl-dev \  
  libbluetooth-dev libdbus-glib-1-dev \  
  mce-dev libosso-dev \  
  libclutter-1.4-dev libtangle-0-dev libpeerhood-0-dev
```

5) Download JamMo source codes

```
git clone http://git.gitorious.org/jammo/jammo.git
```

6) Enter into the JamMo source directory

```
cd jammo
```

7) Configure and compile JamMo:

```
./autogen.sh  
sb2 -e ./configure N900=yes  
sb2 -e make
```

### 3.4 *Compiling for a desktop Linux computer (JamMo and all libraries)*

To compile JamMo for a desktop PC running Linux, you need a fully working development environment with suitable tools for C programming. These instructions suppose that you are using Ubuntu.

1) Enable the universe repository (if you do not have it already):

```
echo 'deb http://archive.ubuntu.com/ubuntu karmic universe' | \  
sudo tee -a /etc/apt/sources.list
```

2) Update the package list:

```
sudo apt-get update
```

3) Install the required tools and libraries:

```
sudo apt-get install git-core automake gtk-doc-tools \  
  libgtk2.0-dev libgstreamer0.10-dev \  
  libjson-glib-dev libsndfile-dev libssl-dev \  
  libbluetooth-dev libdbus-glib-1-dev
```

4) Compile Clutter-1.4.2.

```
sudo apt-get install libgl1-mesa-dev  
git clone git://gitorious.org/clutter-for-maemo/clutter14  
cd clutter14  
./configure  
make  
sudo make install  
sudo ldconfig
```

5) Compile Tangle Toolkit

```
git clone git://gitorious.org/tangle/tangle.git  
cd tangle
```

```
./autogen.sh
./configure
make
sudo make install
cd ..
```

#### 6) Compile Peerhood

```
sudo apt-get install subversion
svn checkout https://www2.it.lut.fi/svn/public/peerhood/trunk/PeerHood_core/
cd PeerHood_core
make
sudo make install
sudo ldconfig
```

#### 7) Download JamMo source codes

```
git clone http://git.gitorious.org/jammo/jammo.git
```

#### 8) Enter into the JamMo source directory

```
cd jammo
```

#### 9) Compile JamMo:

```
./autogen.sh
./configure
make
```

## 4 Web pages

The JamMo application is introduced to potential users, secondary users, and contributors in the JamMo application web pages. The URL is:

<http://www.umsic.org/jammo/>

The pages contain short description of the application, walk through of the main features, links to related projects and instructions how to download the software (see Figure 1).

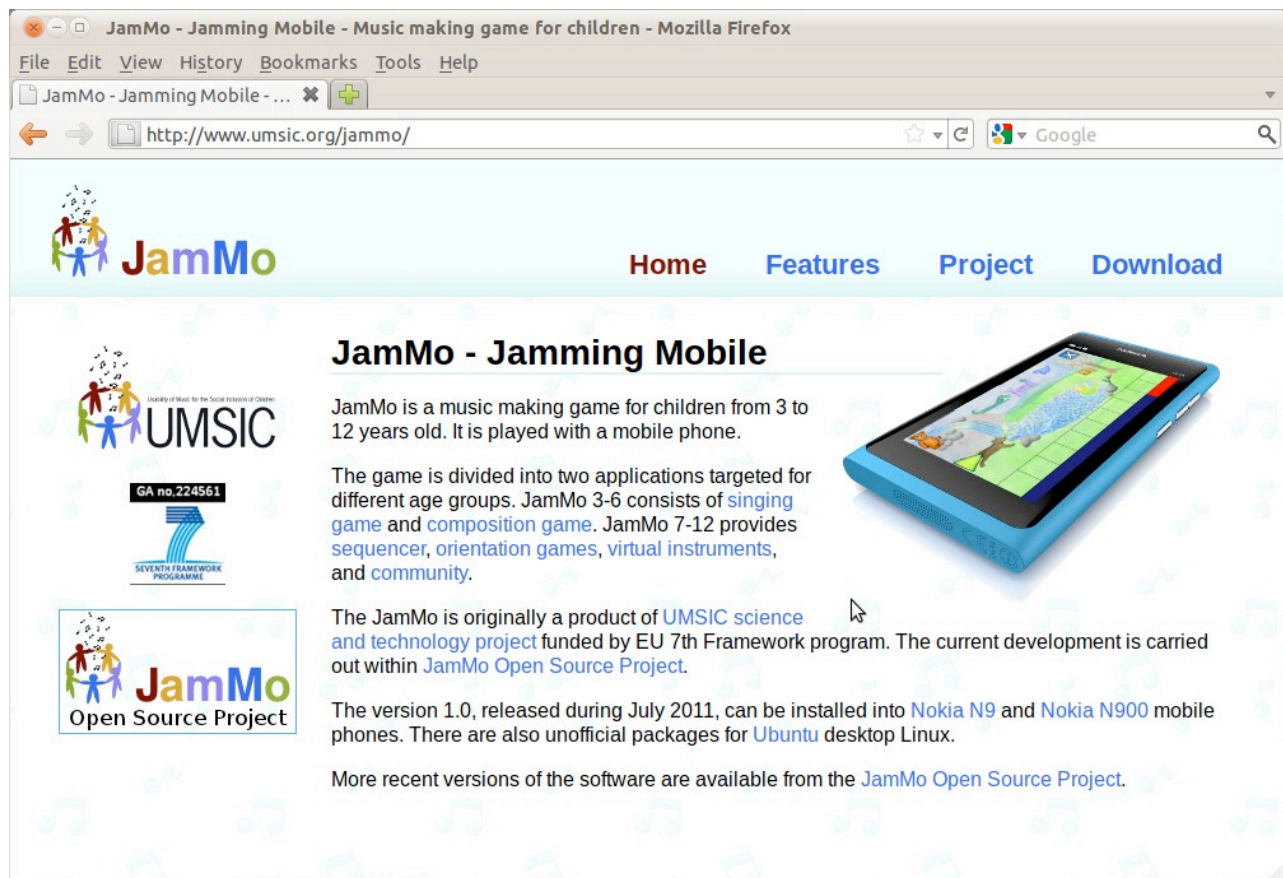


Figure 1. JamMo web pages (<http://www.umsic.org/jammo/>)

## 5 Statistics

Based on the code uploaded into the project version control system, the total size of the application is 85 666 lines of code (LOC). Approximately 13 % is JSON (JavaScript Object Notation) files describing the user interface, and 81 % is programmed using the C language. It must be noted that these numbers contain only the latest version, and the software has been refactored multiple times, meaning that also old code has been thrown away and not included into the statistics.

According to Basic COCOMO Model (Constructive Cost Model), producing 69 220 LOC of embedded software is estimated to require 582 Person-Months (48,5 Person-Years). Thus, the project has been very productive when compared to the limited implementation resources.

The Table 1 summarises the division of work between the main software components as defined in the Annex I as well as between beneficiaries. The category Other contains minor modules and support files, such as application packaging.

**Table 1. Division of work between components and beneficiaries (LOC).**

<b>Component</b>	<b>UOULU</b>	<b>LUT</b>	<b>SYSTEMA</b>	<b>Total</b>
CHUM	32744 (81%)	5295 (13%)	2417 (5,8%)	40456 (47%)
GEMS	127 (0,6%)	20589 (99%)	0 (0%)	20716 (24%)
MEAM	7758 (66%)	4019 (34%)	0 (0%)	11777 (14%)
Other	9444 (74%)	3273 (26%)	0 (0%)	12717 (15%)
<b>Total</b>	<b>50073 (58%)</b>	<b>33176 (39%)</b>	<b>2417 (2,8%)</b>	<b>85666 (100%)</b>

It is also to be acknowledged that the source code in the JamMo version control system does not cover all software that was implemented during the project, or reflect all efforts related to software development. For example, implementation and maintenance of related libraries and separate servers have required resources that are not in the scope of this deliverable. In addition, UOULU has done all release management related to the JamMo application (such as weekly releases since July 2010).

## 6 Authors

The core functionality of JamMo version 1.0 has been implemented mainly at the Department of Information Processing Science in University of Oulu. Lappeenranta University of Technology has focused on networked aspects and provided support for audio backend. Systema has developed Jammer and Pen Gesture components.

The application has been refactored many times, so the contributions of some authors have already been wrote out from the source code. However, we acknowledge everybody here.

### 6.1 Software developers

**Henrik Hedberg**, project manager, UOULU (the core MEAM and CHUM)

**Aapo Rantalainen**, lead developer, UOULU (the application logic)

**Mikko Gynther**, developer, LUT (co-author of GStreamer plugins)

**Tommi Kallonen**, developer, LUT (GEMS)

**Jussi Laakkonen**, developer, LUT (GEMS)

**Eleni Golemi**, developer, Systema (Jammer)

**Aris Plakias**, developer, Systema (Pen Gesture)

**Ville Saarinen**, developer, UOULU (initial community features)

**Antti Ranta**, developer, UOULU (initial community features)

**Kari Vatjus-Anttila**, developer, UOULU (initial community features)

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**Mika Mars**, developer, UOULU (initial CHUM implementation)

**Timo Puikko**, developer, UOULU (initial CHUM implementation)

## 6.2 *Other contributors*

JamMo utilizes musical material provided by the UMSIC consortium. As a result of WP4, JYU has produced virtual instrument sounds, sound loops and samples for the composing game, and IoE has provided additional set of sound loops. UOULU has recorded songs for the singing game and Finnish mentor speeches, and UCLAN has recorded English mentor speeches. In addition, graphics are made by Tiina Uimonen (jammo3-6) and Olli Nokkala (jammo7-12). All this material is distributed in a separate package that is required and automatically installed in order to execute JamMo application.

## 7 License

At September 9, 2008, the UMSIC steering group decided to use GNU General Public License (GPL) version 2. Thus, JamMo is licensed under GPL version 2. Also all data (such as graphics, musical material, and other audio material) is distributed under GPL version 2 in a separate package. The license comply with the Open Source Definition by Open Source Initiative (<http://www.opensource.org/licenses/gpl-2.0.php>).

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