Project:	Synthesis of systematic resources
Project acronym:	SYNTHESYS3
Grant Agreement number:	312253
Workpackage:	2: Improving collections management and enhancing accessibility
Deliverable number:	2.4: Best practise handbook
Deliverable title:	Handbook of Best Practice and Standards for 3D imaging of Natural History specimens
Deliverable author(s):	Jonathan Brecko (RBINS), Aurore Mathys (RMCA)
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Framework and Background

In SYNTHESYS3 Networking Activity 2 (NA2) Objective 2.1 it was set to produce a best practice handbook for 3D imaging. With this handbook as a guideline it would be possible for any institution to create 3D models of their collection.

To achieve this goal a working group of scientists with experience in 3D digitization was set up to cover the different methods of 3D digitisation. Although the working group was delayed due to the leaving of the workpackage leader Alexandre Kroupa (MfN), the working group managed to complete the task after a new Task Leader, Jonathan Brecko (RBINS/RMCA), was chosen.

During workshops in Berlin, Crete and via video meetings, with attendance of Naturalis (The Netherlands), Digitarium (Finland), Hellenic Centre of Marine Research (Greece), Royal Belgian Institute of Natural Sciences (Belgium), Royal Museum for Central Africa (Belgium), Museum für Naturkunde (Germany) and National Museum Prague (Czech Republic), it was agreed upon that as an end result two types of guidebooks are produced.

First of all an online WIKI which can be updated by any institution with access at any time. In this way it is possible to have the latest information possible.

Secondly a handbook with all the common and basic information about a technique including tips and tricks per technique which are likely not to change over time. In this way scientists, technicians, or whomever comes in contact with digitisation, can find more information to understand how certain techniques work and should or can be applied.

1. WIKI Portal

The interface of the WIKI was provided by the Berlin Museum für Naturkunde (MfN). Access to change or add contents on the WIKI page is controlled by the MfN as well. In this way we can be certain that the knowledge shared through the WIKI is solid and of good quality.
The interface of the WIKI is set in a way that it is very easy for contributors to fill out the contents file. By using tick boxes a contributor can chose for instance the size of the specimens to digitise, the costs, the amount of data, the level of experience, etc. Thanks to this method it is very easy for a user to filter between the plethora of available techniques and only come across those which are suited for their own digitisation project.

At the moment of writing this Deliverable following contributions of the Royal Belgian Museum of Natural Sciences (RBINS), Royal Museum for Central Africa (RMCA) and the Hellenic Centre for Marine Research (HCMR) are made, covering the subsequent techniques:
Focus Stacking (RBINS & RMCA)
Infrared Scanning (RBINS & RMCA)
Photogrammetry (RBINS & RMCA)
Structured Light Scanning Large Objects (RBINS & RMCA)
Structured Light Scanning Small Objects (RBINS & RMCA)
µCT Scanning (HCMR)

As it is an online form and more institutes will gain experience using all kinds of 3D digitisation techniques, the page will keep on growing as more institutes will contribute. So the Deliverable is made for the WIKI page, but will continue to be a living document as 3D digitisation will keep evolving. As the WIKI page originates from the MfN, it will be managed by them.

The contents of the WIKI handbook can be found on:
http://biowikifarm.net/v-mfn/3d-handbook/3d_Imaging_Handbook:Main_Page

2. Printed Handbook

The best practice handbook for 3D digitisation will also result in a printed version with more background information on the several 3D scanning techniques available to date. The reason to make a printed version as well is that in this way the basic and background information can be easily consulted and cited. As for the WIKI page, in this book the main part of the information is coming from the digitisation team of RBINS (Royal Belgian Institute of Natural Sciences) and the RMCA (Royal Museum for Central Africa) as they gained a lot of experience using almost all the 3D techniques available during previous projects. The handbook will not deal with µCT scanning because the experts from HCMR have already produced an excellent guidebook on µCT scanning within the scope of the Joint Research Activity (JRA) of SYNTHESYS3. Repeating this information here is therefore not useful, but it will be mentioned here for people looking for that information. To summarise, only outer surface 3D and 2D+ information will be mentioned in the printed handbook.
To date the main information for the handbook is written down, but review from other institutes

is needed prior to printing.

At the moment the following chapters are included

2D: -Focus Stacking (DSLR)

-GigaPan + Focus Stacking Microscope

-Zoosphere

-RTI/MiniDome

3D: -Photogrammetry

-Photogrammetry + Focus Stacking

-Infrared Scanning

-Structured Light Scanning

-Laser Scanning

Access to the soon printed version of the best practice handbook can be through the following link (currently still in draft):

https://drive.google.com/open?id=0B2yIFo9B44xfWk1WSHgxVU51WVk