Digital
Heritage
Center

know
how
books

individual knowledge transfer

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Halina Gottlieb

Research Supporting Innovation

For Museums, Academia and Creative Industries

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About Halina Gottlieb and Significance in the Field

HALINA GOTTLIEB

Halina Gottlieb has conducted her research in the field of Digital Heritage, an emerging interdisciplinary area of study that connects digital technologies, museums studies, interaction design and participatory design. She has earned a PhD degree in this relatively new field with a dissertation entitled "Designing Engagement For Art — Exploring Interfaces and Interpretive Content of Digital Heritage Artifacts in Museum Environments."

As an art historian, digital curator and knowledge transfer facilitator, Dr. Gottlieb has concentrated her efforts on promoting an effective and suistainable exchange of knowledge, practices and skills across fields of research pertaining to digital heritage issues, as well as across relevant sectors, including academia, ICT and creative industries.

Halina Gottlieb is the founding director of **NODEM** (Nordic Digital Excellence in Museums) and co-founder of **DIHA** (Digital Intangible Heritage of Asia) interdisciplinary research cluster.

She is the coordinator of the *Knowledge Triangle* network at the Nordic Council of Ministers, and since 2006, she is the director of *Digital Heritage Center*, a spin-off company from the Interactive Institute/ Vision for Museums research studio.

Halina Gottlieb has been a member of the Executive Committee of EPOCH (European Network of Excellence in Cultural Heritage), as well as the Swedish representative for the EPOCH Network of Expertise Centres (2004-2008).

Significance in the Field

In the course of her long career in the field Halina Gottlieb has led and assisted the conception, development and evaluation of numerous digital prototypes aimed at improving the communication, experience and understanding of cultural content in museum environments. While collaborating in several international research projects, she has initiated, together with her cross-disciplinary team at the Digital

Heritage Center, numerous innovative solutions directed at supporting the implementation of digital technologies in art and science museums, as well as developed new academic curricula.

Besides the development of the actual prototypes and the modeling of advanced media tools for improving visitors' interpretation and communication in museums, these innovations also include services, methods and practices to assist stakeholders (culture professionals, educators, SMEs in the ICT and creative industries, and policy makers) in the transfer of newly created knowledge and know-how.

This latter area of activity resonates with one of the primary objectives that Halina Gottlieb pursued as director of the Digital Heritage Center, namely that of bridging the gap between professionals and researchers in the fields of cultural heritage, ICT, creative industries, and individual creators. Among the actions conducted in order to further this important objec-

CULTURAL PROBES – SHAPING THE VISION

INCUBATOR FOR CREATIVE INDUSTRIES

FORMATIVE PROCESS – SHAPING THE CONCEPT

NEW CURRICULA AND RESEARCH CLUSTERS

USE QUALITIES METHOD

NODEM

EVALUATION OF EDUCATIONAL IMPACT

INTERACTIVE SALON

KNOW-HOW BOOKS

INNOVATIVE INTERFACES AND STORY-TELLING

Visitors 21-st century —
Digital artefacts for cultural heritage

tive, one may count academic and on-site courses, practical seminars, research and thematic clusters, workshops and research meetings with the participation of interested partners, interdisciplinary and international conferences, incubator programmes, as well as the publication of research studies, support materials and know-how books.

Initiatives and Achievements

As a studio director at the Interactive Institute and Vision for Museums, and then as director of the Digital Heritage Center, Halina Gottlieb has promoted and initiated a significant number of projects, activities, and services, of which the most notable are:

- The development of several interface prototypes for interpretive use and innovative communication with visitors;

- The design of a number of research methodologies, aimed at the preliminary, formative and summative assessment of digital artifacts and

their cognitive and aesthetic impact on visitors in different museum environments;

- The creation of a Visitor Study Lab — a mobile research station for capturing the engagement of visitor experiences and interaction modes of digital interfaces;

- The creation of an experimental laboratory for the gradual testing of prototypes as their development process unfolded;

- The organization of the Interactive Salon, an international traveling exhibition that showcased research prototypes, ICT products and occasioned collaborative and formative activities with broad stakeholder participation.

10 Innovations for Museums, Academia and Creative Industries

Designing
Engagement
for Art

- Motivation
- Immediate Experience
- Creation of Meaning
- Social Implications
- Structural Qualities

Conceptual Contributions
Applied Contributions
Methodological Contributions

Experimental Prototyping
Participatory Design
Interdisciplinary
Field Study

RESEARCH TOOLS
CONTRIBUTIONS
PROTOTYPES
USE QUALITY GROUP
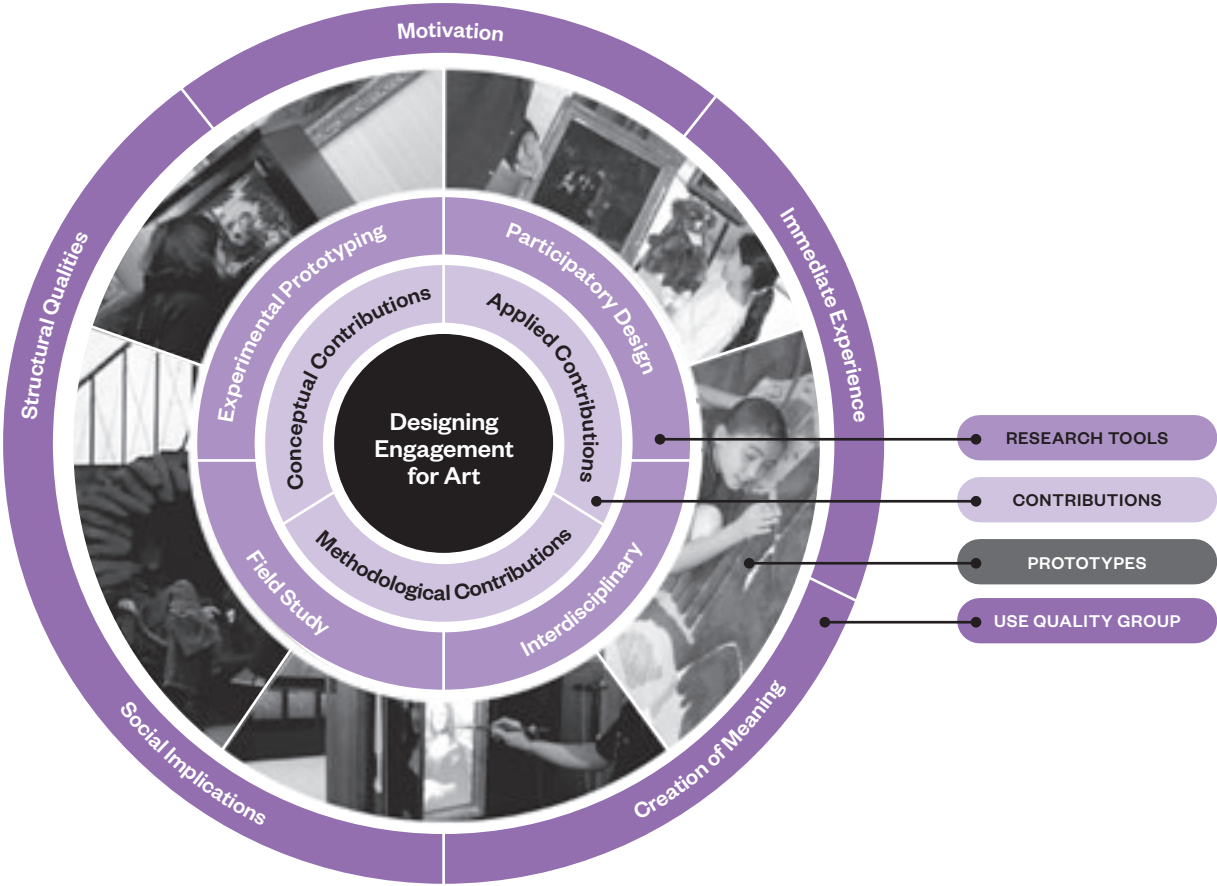
1. CULTURAL PROBES AS FRONT-END EVALUATION — HOW TO SHAPE THE ORIGINAL VISION OF AN EXHIBITION TOGETHER WITH THE VISITORS

Cultural probes as front-end evaluation is a method that is about the consultation with visitors on the whole concept of an exhibition, and a way to shape the vision of the exhibition together with the visitors. This method forces us to question our assumptions about visitors, about their understanding, about their attitudes and beliefs, about how people learn and why they come to museums in the first place; and about our accustomed approaches to exhibit and program design.

Using cultural probes as front-end evaluation may yield valuable insights into visitor behavior, attitudes and motivation in relation to visiting museums, but also into the knowledge and interests of the visitor in relation to the specific topic of an envisaged project. This method may probe a variety of relevant variables such as visitor understanding, preconceptions, or familiarity with the subject of the exhibition.
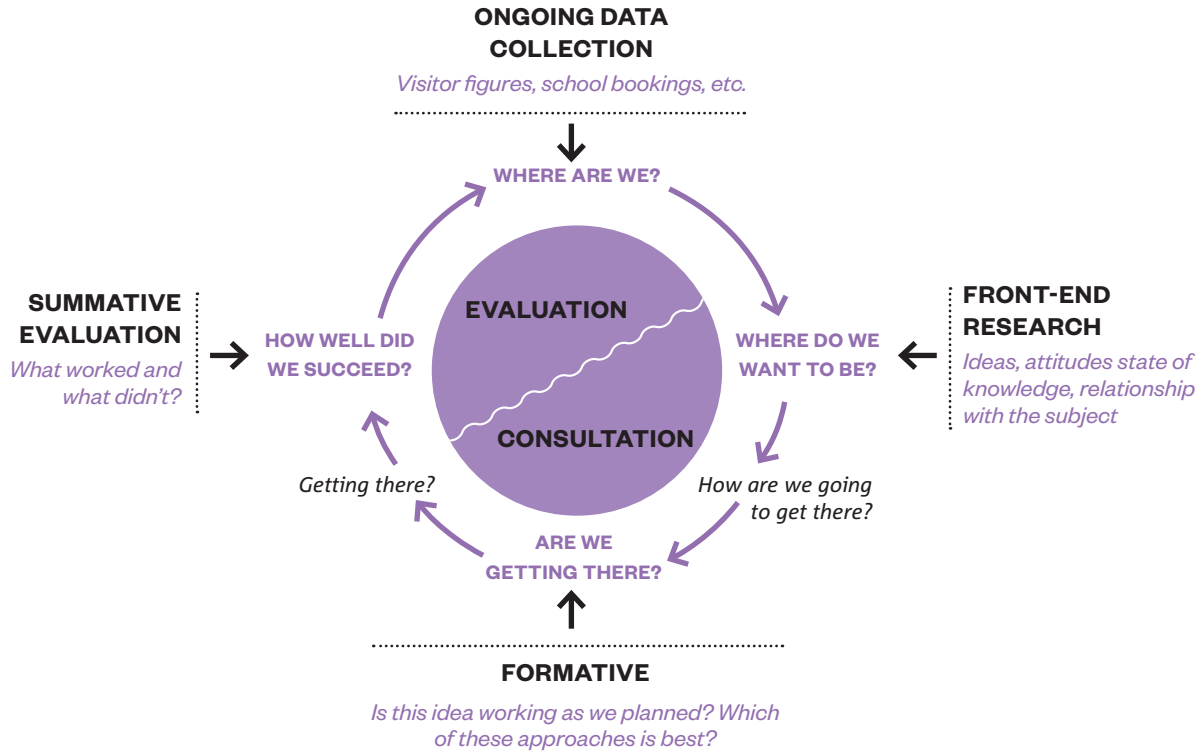
Example and Implementation

The method of cultural probes was utilised by Halina Gottlieb in the project "Storytelling Animals" at the National Museum in Stockholm, where young visitors were invited to participate in an exploratory workshop. The purpose of the workshop was to find out what children thought about digital museum guides as an interpretive concept, interface and mode of interaction, and to inspire unexpected ideas about digital guides from this interaction. The participants were asked to test and discuss different objects as potential museum guides, and to try to contextualize this in terms of an individual visit or a group visit. This workshop helped greatly in clarifying an outline for the prototype.

Advantages of Cultural Probing

This method provides a valuable tool for improving the design of exhibitions and programmes. Visitor feedback can be thus incorporated into the development process before investing too many resources into a project. As such, it constitutes a first step towards guaranteeing the success of a planned exhibition and opens a conversation between museum staff and advisors, between visitors and the subject matter.

Cultural probing has also long-term benefits, whereby systematic knowledge is gathered about various target groups in relation to a variety of topics, contexts, interfaces and interaction modes.

The Visitor Studies Planning Wheel

ONGOING DATA COLLECTION

Visitor figures, school bookings, etc.

WHERE ARE WE?

SUMMATIVE EVALUATION

What worked and what didn't?

HOW WELL DID WE SUCCEED?

EVALUATION

CONSULTATION

WHERE DO WE WANT TO BE?

FRONT-END RESEARCH

Ideas, attitudes state of knowledge, relationship with the subject

Getting there?

How are we going to get there?

ARE WE GETTING THERE?

FORMATIVE

Is this idea working as we planned? Which of these approaches is best?

2. MULTIDISCIPLINARY EXPLORATORY WORKSHOPS — HOW TO VISUALIZE THE CONCEPT OF AN EXHIBITION BY INCLUDING THE PERSPECTIVE OF MUSEUM PROFESSIONALS AND VISITORS

One crucial aspect that characterizes Halina Gottlieb's research is that it is grounded on multidisciplinary and interdisciplinary collaborations.

Halina Gottlieb has conducted her research in the form of case studies, in which museum practitioners and researchers could collaboratively explore design ideas related to ongoing local exhibition projects. Professionals from the cultural heritage sector were invited to creative experimental workshops and brainstorming sessions with multidisciplinary attendees.

Exploratory Workshops

Since the visualization of a concept is an organic process of research and exploration that rests on collaborative efforts, it is vital to include, throughout the development of a prototype, the point of view of professionals from relevant fields.

Exploratory workshops can be incorporated into projects as a natural and essential part of the work process. The workshop format gives participants an opportunity to make contact with people from other experience-oriented industries and gain insights into projects in other public spaces.

The purpose of the exploratory workshops is to create collaboration between professionals from research studios, from cultural heritage sectors (particularly museums educators), from creative industries, and from IT sectors. The starting point is to bring together people with a wide range of competencies and create a meeting place where a concept can be discussed. An example of a topic for a workshop could be to find out whether environments from the traditional entertainment industry can offer museums new approaches to public relations.

Advantages of the Approach

This approach enables all stakeholders (museum professionals, educators, representatives of creative industries, artists, designers) to personally become acquainted with the ideas and concepts, to reflect on the research and elaboration process, to get familiarized with new ways of visualizing innovative concepts for the use of digital media, and to enrich the process of creation with insights from their own perspectives.

Research carried out during the development stage helps the process of finding and establishing a meaningful dialogue with visitors. In more concrete terms, it assists in finding adequate ways to engage the visitors by relating to their own interests, and by anchoring novel content to already existing references in their everyday lives.

Creative and Research Processes — 2000–2006
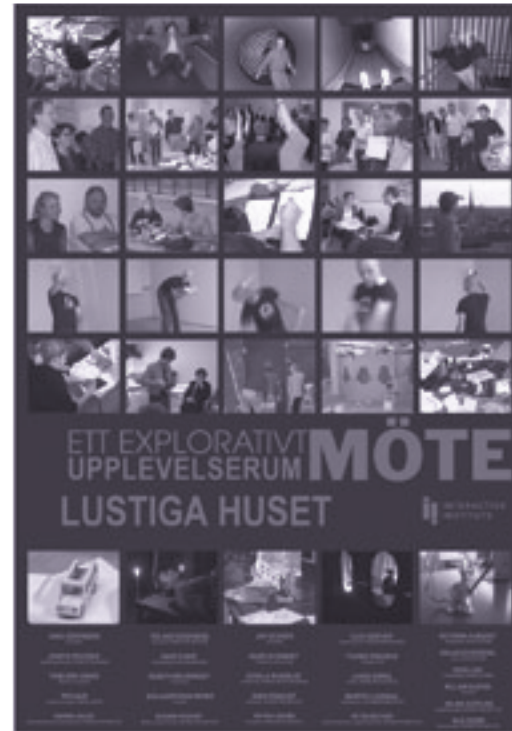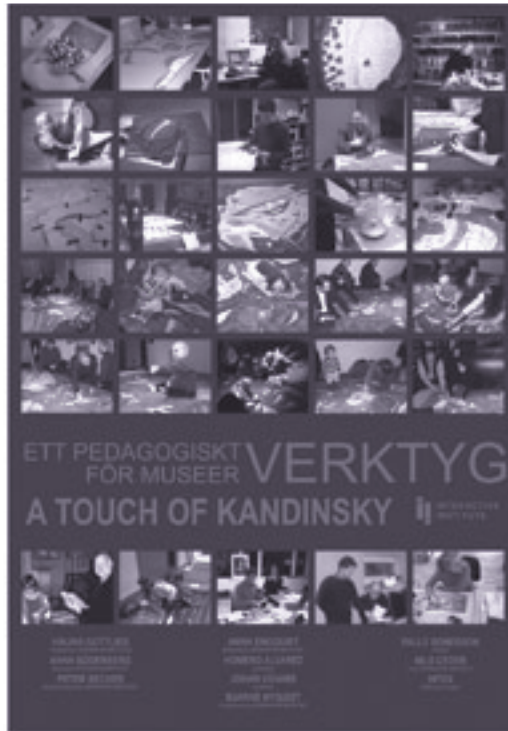
Creative and Research Processes — 2000–2006
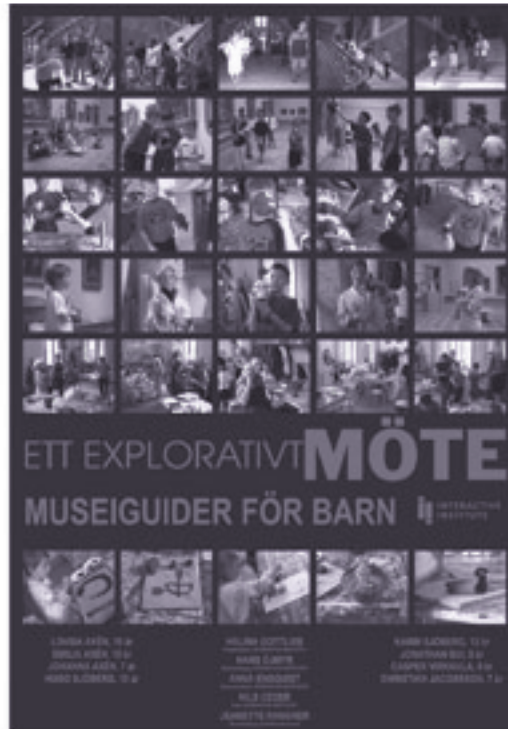
3. USE QUALITIES OF DIGITAL ARTIFACTS — HOW TO EVALUATE THE VISITOR'S DIRECT EXPERIENCE OF CONTENT AND INTERFACES

Halina Gottlieb has evaluated the use qualities of digital artifacts in the evaluation and development of several interactive prototypes and interfaces. This method helps you gain valuable insights about digital installations or digital exhibition pieces (digital artifacts) in terms of their use qualities. In this context, it is meaningful to address primarily those properties that enhance visitor engagement with the subject matter of a digital artifact and the overall theme of the exhibition.

In her work, Dr. Gottlieb has focused on measuring aspects related to how motivating and 'seducing' a digital artifact appears to the visitor, how 'playable' it is, how it relates to a visitor's own interests and everyday references, as well as to what extent it can provide a social action space by promoting meaningful interactions with other visitors. Other aspects may concern the degree of flexibility, fluency or autonomy of a given interface in the hands of the visitors, as well as structural qualities, such as intuitiveness and accessibility, but also content-related features such as the complexity of the meaning that emerges in the interaction between the visitors and the exhibition.

Example and Implementation

The evaluation of use qualities of digital artifacts was conducted during the ambulating exhibition "Interactive Salon", in 2006–2009. Four digital artifacts — "Touch of Kandinsky", "Access in Mind", "Electro Bacchanalia" and "Old Masters Paintbrushes" — were evaluated using this approach.

In order to establish which use qualities were most relevant for digital heritage artifacts a questionnaire survey was designed and carried out to give a broad picture of the visitor experience and their levels of engagement.

The data collected from this evaluation revealed that the most effective use qualities for the purposes of engagement with interpretive content and intellectual accessibility were those that appealed to the user's sense of motivation: e.g. elements of playability, seductivity, relevance and usefulness. For instance, playability — typically associated with games — provided one successful approach with which to build a prolonged interaction with the visitor, as seen in the "Touch of Kandinsky" installation. Dramaturgic concepts such as seductivity, anticipation and immersion were also used to great effect in some of the installations (e.g. in "Access in Mind").

Advantages of the Approach

The advantages of evaluating use qualities of digital artifacts lie in the combination of a focus on the visitor with a focus on interaction modes and interfaces. It employs methods such as evaluation studies, and both assists in assessing how well the exhibited collection has met its stated goals and also helps to identify shortcomings and potential remedial changes to inform future planning efforts.

Summative Evaluation — Use Qualities Method

PLAYABILITY:

"Fun, cool to see the painting animated!"

SOCIAL ACTION SPACE:

"I just started talking to other visitors"

FLUENCY:

"It was easy to start and to end playing with it"

SEDUCTIVITY:

"I guess I'll roll this up and take it home"

MOTIVATION & SOCIAL IMPLICATIONS:

"If this was put in a museum, people might fight over it"

CREATION OF MEANING:

"I learned more about how to understand art"

ELEGANCE:

"Interesting, unique way of presenting information"

RELEVANCE & USEFULNESS:

"The voices said very interesting things about art, feelings, life in general"

MOTIVATION
Playability
Relevance&Usefulness
Seductivity
Anticipation

SOCIAL IMPLICATIONS
Social Action Space
Connectedness
Identity

STRUCTURAL QUALITIES
Transparency
Elegance

USE QUALITIES OF INTERFACES & CONTENT

CREATION OF MEANING
Parafunctionality
Ambiguity

IMMEDIATE EXPERIENCE
Pliability
Control / Autonomy
Immersion
Fluency

4. TRIANGULATED METHOD OF EVALUATION — HOW TO EVALUATE THE EDUCATIONAL IMPACT OF AN EXHIBITION AND THE NEW KNOWLEDGE ACQUIRED BY VISITORS

Halina Gottlieb developed the Triangulated Method of Evaluation in 2004 in collaboration with Lena Geijer and Eva Insulander. The Triangulated Method of Evaluation uses evaluation methods from different disciplines, and is a novel methodology for evaluating the educational and cognitive impact of digital media in cultural heritage environments by assessing learning in the context of an interactive museum exhibition.

Through this method, emphasis is placed on the dialogue that is established between the exhibited artifacts and the visitors. Meaning is viewed as emerging multimodally through a variety of communicative channels: text, photographs, images, animation, color, light, sound, music, etc. As such, artifacts are the mediating tools of inner transformation or learning.

Example and Implementation

The Triangulated Method of Evaluation was used in the assessment of "Access in Mind", an audio-visual installation for art galleries. This prototype was developed in 2002 by the Interactive Institute in collaboration with the Swedish Arts Council, and has the function of introducing visitors to contemporary art.

By employing a triangulated method of evaluation that linked digital tracking, observation, and questionnaires, it was possible to reveal that young visitors who had tested the installation before entering the gallery were more comfortable in engaging with contemporary art and dwelled longer in front of the exhibited pieces.

In this instance the methods employed to study the prototypes were visitor study methods from museum studies and methods from human–computer interaction,

where the focus lies on interaction modes and interfaces. The evaluation included observation studies, questionnaires and the collecting of comments from visitors. This triangulated method of evaluation was used in order to develop a more detailed picture of the aspects of the use qualities of digital artifacts that would enhance engagement in, and understanding of, art, thus securing a path to long-term knowledge augmentation.

Advantages of the Approach

A combination of different evaluation methods can provide a more reliable and representative picture of visitor engagement and understanding. This method is a good starting point for further evaluation and can help, for example, when deciding what questions should be asked using further evaluation methods.

THE ARTIST

When people say: "What the hell is this? this is only crap!" — Because many people say that — then one can react in two ways. Either you can despise these people because they are stupid that they don't understand that this (art) is fantastic, or you can be really curious: "Why do they say that? What do they mean?"

THE YOUNG GUY

I don't understand. I feel like I will burst with longing: I don't understand, why love should hurt that much? I just want to be happy and in love, but it doesn't work. I can't eat, I can't sleep. All the time I spend away from A (her) is meaningless. Empty! How does one spend ones time? Can you explain that?

THE CONSCIENCE

Who are you anyway? You are here now: you are the one who came with your life and your experiences. Right now, that is the most important thing.

5. NOVEL INTERFACES AND NARRATIVE METHODS FOR ENHANCING AESTHETIC EXPERIENCE

Halina Gottlieb has developed and assessed a variety of human–computer interfaces and interpretive concepts of digital media for external communication with visitors at art and science museums. This endeavor has resulted in the practical exploration of possibilities for enhancing engagement and intellectual accessibility of, for example, Old Masters or abstract and contemporary art, through novel interfaces.

Each of the prototypes developed within this framework represents an alternative approach to the use of digital media in art museums and can complement existing perspectives and approaches in user-centered design.

Example and Implementation

Two examples of novel interfaces and narrative methods developed by Halina Gottlieb, are "Old Masters Paintbrushes"

and "Storytelling Animals (II)". In "Old Masters Paintbrushes" the visitors interact with a digital replica of a painting using a set of five interactive paintbrushes. Each paintbrush behaves differently when in contact with the screen and activates sensors that reveal the layered techniques employed by the Old Masters in creating their paintings. The exhibit illustrates also an innovative approach to the visualization of intangible heritage in terms of artistic skills.

In the project "Storytelling animals (II)", The Interactive Institute, in collaboration with Sennheiser, developed audio guides for Universeum Science Discovery Center in Gothenburg. The guides present four different animals: wolf, beaver, adder and salmon, that guided the visitors along The Water's Way exhibition, giving an overview of their own habitat. Each animal narrated about the conditions governing its life in the Swedish landscape.

Advantages of the Approach

Digital exhibits bring forth hidden qualities and allow exploiting several layers of meaning. They have the potential to shape and enrich interpretive content, to reveal new angles, and propose unexpected perspectives, to add novel affective and cognitive dimensions, going beyond the surface layers that are immediately accessible to a visitor's senses.

These prototypes for cultural communication were aimed at stimulating a visitor's engagement with the subject of the exhibition, but also to facilitate intellectual accessibility. In addition, storytelling represents a priceless tool of effective knowledge transfer in the context of cultural heritage. With the help of digital artifacts, novel narrative interfaces can be devised which expand interpretive content innovatively in a variety of ways.

In „**Old Masters Paintbrushes**" (exhibited at the Interactive Salon in Stockholm and at the Science Centre in Singapore), the visitors interact with a digital replica of a painting using a set of five interactive paintbrushes. Each paintbrush behaves differently when in contact with the screen and activates sensors that allow to **reveal the layered techniques** employed by the Old Masters in creating their paintings. The exhibit illustrates also an innovative approach to the **visualization of intangible heritage** in terms of artistic skills.

Old Masters Paintbrushes was appreciated in terms of its **sensory richness**: the installation enabled the visitor to experience distinct visual-tactile interactions while using the brushes and acting from a novel posture — that of the creating artist.

In the project „**Storytelling animals (II)**", The Digital Heritage Center, in collaboration with Sennheiser, has developed audio guides for Universeum Science Discovery Center in Gothenburg. The guides present four different animals: wolf, beaver, adder and salmon — all of which are confronted nowadays with loss of habitat due to mankind impact. The animal-guides lead the visitors along The Water's Way exhibit, giving an overview of their own habitat. Each animal narrates about the conditions governing its life in the Swedish landscape. Every audio guide consists of a headset and a bracelet decorated in a theme associated with the specific animal. The four

audio guides have distinct scripts that are read out by different actors and the narratives pause at different stations in The Water's Way area. The wolf's audio guide is the longest and the most multimodal of the four and stops at the most stations. It encourages the child to actively interact with the exhibit's environment and has environmental sounds, sound effects and dramatised music. The beaver's audio guide has no interaction, but has environmental sounds that enhance the feeling of being out in nature. The salmon and adder are both without interaction and sound effects, consisting of only an actor's storytelling voice.

THE WOLF

THE ADDER

THE BEAVER

THE SALMON

6. KNOW–HOW BOOKS — KNOWLEDGE TRANSFER

Under the auspices of EPOCH and the Interactive Institute, Halina Gottlieb has created a KNOW-HOW book series aimed at bridging research findings, technological innovations and everyday practice for museum professionals.

 The KNOW-HOW series comprises several instructional and inspirational booklets that offer, step-by-step, guidelines for the design, development and realization of digital installations and applications for the cultural heritage sector. The detailed description of already implemented projects is supplemented with thoughtful suggestions for alternative solutions and applications within the cultural heritage sector.

The KNOW-HOW booklets cover projects in the following categories: MUSEUMS, HERITAGE SITES and MONUMENTS. The reader is initiated into the new field of digital heritage by an introductory volume with general guidelines for cultural heritage professionals in the effective and sustainable use of digital technology at Monuments, Museums, and Sites.

Advantages of Using Know-How Books

The KNOW-HOW books provide in a simple and easy to understand format, valuable information about innovations for museums and creative industries. Through this medium, museums can inform themselves of innovations and make connections with cutting-edge researchers within the field. The information covered within the booklets benefits managers, exhibition producers/curators, pedagogues and professionals working with digital restoration, as well as those working with communication and audiences.

THE KNOW-HOW SERIES

INTRODUCTORY VOLUME

- **Cultural Heritage Professionals in the Effective and Sustainable Use of Information Technologies in Monuments, Museums, and Sites.**

#### MUSEUMS

- Electro Bacchanalia — a peep box and an interpretive tool for Old Masters' paintings
- Interactive Storytelling Exhibition — How to produce a virtual interactive story to engage visitors with the real world
- Virtex — A multisensory approach for exhibiting valuable objects
- The ARC 3D Webservice — How to turn images of an object or scene into 3D models for exhibitions and archives
- Touch of Kandinsky — How to make a carpet into an interactive or storytelling tool

HERITAGE SITES

- Interactive Landscapes — How to read and understand historical landscapes
- Interpretation Management — How to make sustainable visualisations of the past
- Presenting The Hidden Past — Highlights and impressions from the lowlands

MONUMENTS

- Monitoring Monuments — A low-cost digital early warning system for preventive conservation of built heritage
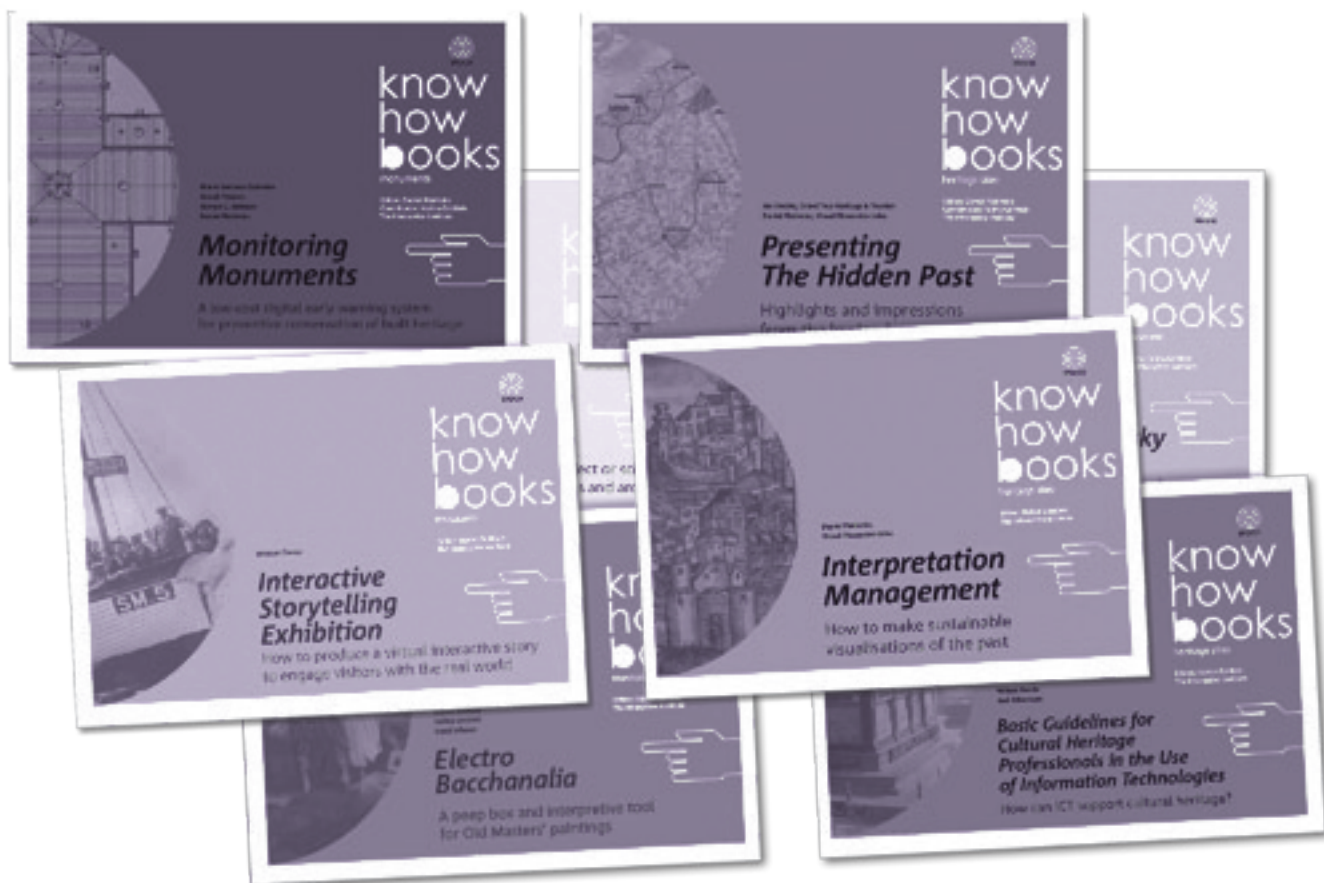
7. INTERACTIVE SALON — A TOURING EXHIBITION SHOWCASING INNOVATIVE USES OF DIGITAL TECHNOLOGY AT CULTURAL HERITAGE SETTINGS

In 2006-2007, Halina Gottlieb initiated the Interactive Salon, a showroom for technologies that promote and preserve cultural heritage. The Interactive Salon is a touring exhibition showcasing innovative technologies and concepts for communication with visitors in different museum environments.

Projects from European research institutes, universities and museums have been invited to demonstrate how new technology and concepts can enhance visitors' experience, interpretation and communication in museums and similar environments through the Interactive Salon. The projects presented at previous Interactive Salon's offered examples of the five main types of digital media technology that have been applied to museum environments, and illustrated a broad spectrum of partnership constellations, including government authorities, SMEs, IT companies, foundations supporting projects, museum content providers, heritage sites, media producers and research institutes.

The Interactive Salon includes collaborative and formative activities (meetings, evaluations, scenario labs, seminars and workshops) that are organized throughout the event with the purpose of supporting cultural heritage institutions in their dialogue with other stakeholders, promoting a greater sharing of expertise, and disseminating case studies of successful applications of ICT to cultural heritage. Furthermore, the exhibition presents a great opportunity for letting the public take part of ongoing research projects.

Prototypes at the Interactive Salon in Stockholm:

- *3D web service* — by the University of Leuven (Belgium) / EPOCH

- *Hokusai Manga* — by Museum of Far Eastern Antiquities / Touch & Turn (Sweden)

- *The magic book scroll* –by Swedish Institute of Computer Science / the Royal Institute of Technology / the Museum of Science and Technology in Stockholm (Sweden)

- *Interactive Café Table* — by Digital Heritage Center (Vision for Museums) / Interactive Institute / Stockholm City Museum (Sweden)

- *Touch of Kandinsky* — by Digital Heritage Center (Vision for Museums) / Interactive Institute (Sweden)

- *Access in Mind* — by Digital Heritage Center (Vision for Museums)/Interactive Institute / Swedish National Council for Cultural Affairs (Sweden)

- *The Arrigo VII kiosk* — by Soprintendenza ai Beni A.P.P.S.A.D / Istituto di Scienza e Tecnologie dell'Informazione (ISTI) / C.N.R. Pisa / X-Lab / Universita' di Pisa / Universita' di Firenze (Italy)

- *Culturama* — by Centre for Documentation of Cultural and Natural Heritage (Egypt)

- *The Works* — by The Interactive Institute / Avesta kommun (Sweden)

- *Smart Museums Sites and Landscapes* – by Pervasive Computing group / Computing Laboratory / University of Kent (England) and ARCES / Università di Bologna (Italy)
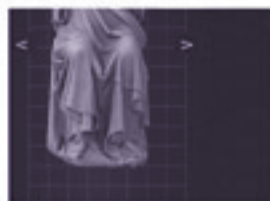
8. NODEM — WHERE TO FIND RELEVANT COMPETENCIES AND PARTNERS FOR COLLABORATION

In 2002, Halina Gottlieb founded, in partnership with the Interactive Institute, a project called Nordic Digital Excellence in Museums (NODEM). Under the aegis of NODEM, the Digital Heritage Center has organized a series of conferences with international participation that take place once a year in different parts of the world. The aim of this series is to provide a conference forum which stimulates the development ofnew insights and innovative solutions by assisting and supporting the collaboration between researchers, artists and cultural professionals.

Each conference is centered on a core theme allowing the participants to systematically bring contributions and discuss issues aimed at consolidating the interdisciplinary grounds of employing digital technology in the service of cultural heritage. The themes span from abstract and theoretical topics to concrete issues concerning the actual implementation of digital technology.

Today, NODEM is an interdisciplinary portal that brings together researchers, SMEs, artists and cultural professionals from all over the world, providing an interface between-research in the fields of digital technologies and cultural heritage.

NODEM's mission is to mediate this knowledge transfer and aid the implementation of digital tools in museums, galleries, exhibitions, natural and cultural heritage sites. The ambition of the portal is also to create a repository of knowledge, know-how and best practices departing from the experiences, innovations and insights that emerge in the context of such collaborations. This repository is publically available at www.nodem.org.

Currently, NODEM is a vibrant community with over 1000 active members that represent a great variety of fields of activity and areas of research, including interaction design, exhibition design, museum studies, media and communication studies, digital curation, and technologies.

NODEM CONFERENCES:

- **NODEM 2003: Interdisciplinarity in Digital Heritage, Helsingborg, Sweden.**

- **NODEM 2004: Exhibition — Exchange — Know-How, Helsinki, Finland.**

- **NODEM 2006: Digital Interpretation in Cultural Heritage, Oslo, Norway.**

- **NODEM 2008: Experiences in Natural and Cultural Heritage, Reykjavik, Iceland.**

- **NODEM 2010: From Place to Presence, Copenhagen, Denmark.**

- **NODEM 2012: Future Culture: [In]tangible Heritage — Design — Cross Media, Hong Kong, China.**

- **NODEM 2013: Beyond Control — The Collaborative Museum and its Challenges, Stockholm, Sweden**

NODEM venues 2003–2012

NODEM 2012 Hong Kong
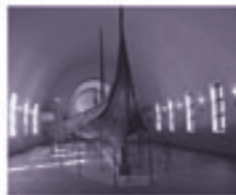
9. INNOVATIONS FOR ACADEMIA — RESEARCH CLUSTERS, NEW ACADEMIC CURRICULA AND PRACTICAL SEMINARS

Research Clusters

Several approaches attending to the goal, yet with distinct theoretical frameworks and specific methodological tools and practices, can only benefit each other. For this purpose, Halina Gottlieb has promoted the model of thematic or research clusters, as a way of addressing knowledge exchange and transfer, this time triangulating and strengthening the connections between cutting-edge research, new curricula within academia and society.

One such research cluster is DIHA (Digital Intangible Heritage in Asia) that joins together researchers, but also undergraduate and postgraduate students with a variety of academic backgrounds, spanning from linguistics, history, design, interactive media, computer engineering to museum studies. The group focuses on the documentation, archiving and preservation of intangible cultural heritage, interdisciplinary studies of cultural identity, and promoting models for content development and interdisciplinary collaborations.

New Academic Curricula

Halina Gottlieb has also developed a new academic module on the use of digital media in museum environments for the University College of Film, Radio, Television and Theatre (Dramatiska Institutet), in Stockholm. Entitled Exhibition Visitors and Digital Media (Utställningsbesökare och digitala medier), the course was directed at exhibition designers, museum employees, IT and multimedia producers interested in acquiring knowledge and specializing in the field. Endorsing an interdisciplinary framework, the course touched upon relevant topics, including an overview of current and future digital technologies to be deployed in museum environments. A textbook with the title "Digital media for museum visitors (Digitala medier för besökare på museer)" was published by Halina Gottlieb in collaboration with Paul Henningsson in 2004, in conjunction with the course.

Practical Seminars

Halina Gottlieb has initiated a series of practical seminars for museums and other cultural or educational sites. The seminars focus on introducing the new interdisciplinary field of visitor studies as a theoretical and practical tool for developing the communication of cultural content for audiences to culture professionals and educators. A number of international guests, key names in the field, have been invited to give lectures and practical training. Topics discussed during the seminars focused on methods for getting access to visitors' understanding and needs in the context of cultural experiences. Methods for approaching and incorporating the specific needs of certain categories of audiences (e.g. children, visitors with disabilities) were also addressed.

Academic textbooks (2003–2006) and DIHA projects (2009–2012)

10. INCUBATOR PROGRAMME — WHERE TO FIND COMPETENCIES THAT WILL HELP YOUR SME GROW

The Incubator Programme is primarily directed at companies within the creative industry that are in their startup phase and envisage engaging in projects that focus on promoting the use of digital media for cultural heritage purposes. The Incubator model that Halina Gottlieb initiated at the Digital Heritage Center includes, among other types of services and assistance, infrastructure resources, network support, individual coaching, as well as a host of training activities.

The startup companies are offered, 2 days a week, a workspace at the Digital Heritage Center / The Interactive Institute in Stockholm. In this environment, the SME can grow and develop its business, by directly participating in projects initiated by the Digital Heritage Center within its Incubator programme, as well as in projects commissioned by third parties.

The individual coaching is offered to target relevant aspects based on the specific needs of the SME, offering expertise in IT, business, advertising, analysis, etc. The Incubator model is also an instrument to facilitate the process of making an experimental prototype into a commercial product. Finally, the startups within the Incubator can participate regularly in formative activities such as lectures, workshops and study visits.

The first company to emerge from the Incubator Programme was Evoking Spaces, in 2006. The company specializes in designing audiovisual experiences for visitors at museums and other cultural heritage sites. Evoking Spaces was involved, as its first commissioned project, in the development of the Interactive Salon exhibition in Stockholm.

"Touch of Kandinsky", "Breathing Life into a Painting" and "Old Masters Paintbrushes" became commercial products at the Swedish SME Evoking Spaces, and were ordered for the Universal Forum of Cultures, B.A.N.G exhibition at Planetarium ALFA in Monterrey, Mexico in 2008; for the permanent exhibit at Papalote Children's Museum, Mexico City, Mexico in 2008; for Stockholm City Museum in 2008; and for the Science Centre in Singapore in 2009, among others.

In the spring of 2006 I got the chance to start my own business with support from the Digital Heritage Center. The Incubator programme didn't just give me a workspace; it also provided me with the opportunity to work on projects initiated by the Digital Heritage Center and the Incubator. This was very good since the most important and most difficult task for a new business is to get assignments. I received funding for six months, which was a welcome start and helped me to focus on important things without worrying too much about surviving the first period.

(David Berner, Evoking Spaces).

Incubator for SMEs (2007–2010) at the Interactive Institute, Stockholm–Kista, the Electrum building
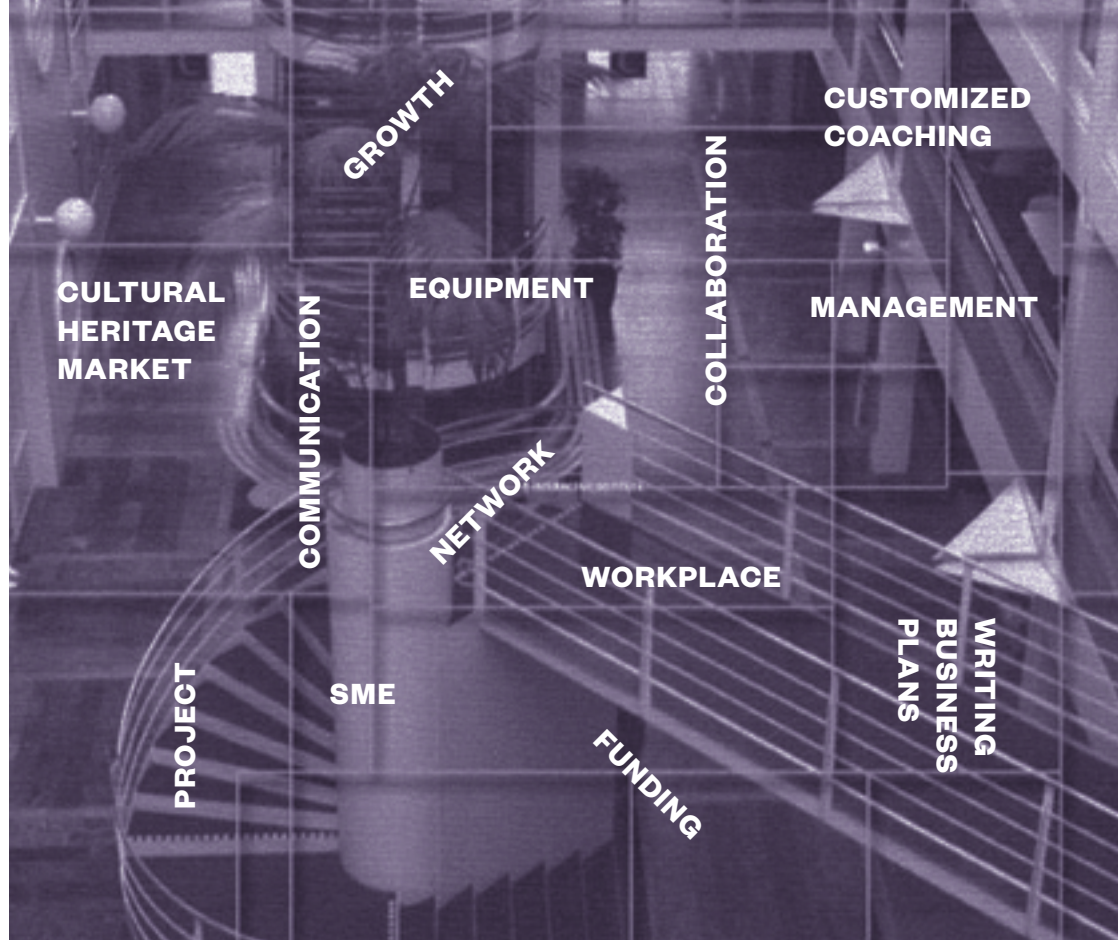
The know-how books act as a bridge between research findings and everyday practice for people working in the cultural heritage sector and creative industry. The aim is to support people working in museums, heritage sites, monuments, CH managers, exhibition producers/curators, pedagogues and professionals engaged in restoration, site management and preservation, as well as those responsible for communication to different audiences and the public at large.

The books in the series are an outcome of the Culture KICK project. Culture KICK is a university based network involving 8 partners from Norway, Sweden, Denmark, Finland and Island which conduct practice-based and collaborative research with creative industry partners as well as heritage institutions.

The project started as an initiative of University of Oslo / Intermedia and Interactive Institute Swedish ICT / NODEM (Nordic Digital Excellence in Museums), and is financially supported by the Nordic Council of Ministers (Norden).

All the books in the series are provided in hard copy and electronic versions in order to provide open access to research results to museum professionals.

The Interactive Institute Swedish ICT acts as coordinator, editor and publisher of the Know-how Books series for Culture KICK.

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