Museum Exhibition:
Investigating the Use of Design Elements in Narrative-oriented Exhibitions - a Case Study of the Canadian War Museum's Permanent Exhibition

by

Napapong Naparat

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INVESTIGATING DESIGN ELEMENTS IN NARRATIVE EXHIBITIONS

Abstract

This thesis investigates the use of design elements in the Canadian War Museum's permanent exhibition. The goal is to understand how and to what extent design, in the form of new media and technologies, contributes to the communication of the exhibition's messages. A qualitative and interdisciplinary approach is taken using three research methods: (a) interviews of museum professionals; (b) an analysis of the media database; and (c) a descriptive visual analysis of selected media units. The findings suggest that design elements are used to enhance the intended messages in terms of both physical and informational accessibility. These results indicate a direct and influential role design elements play in conveying the messages, as they are the primary channels through which the audiences acquire information. This research provides a better understanding about the elusive properties and values of museum exhibition mechanism.

Keywords: museum exhibition, narrative, exhibition design, message communication, new media, technology integration, audience interactivity

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Introduction

This thesis research examines the permanent exhibition of the Canadian War Museum (CWM) in Ottawa, which opened to the public in May 2005. The exhibition's messages, presented in the form of a narrative, is conveyed through the carefully designed three-dimensional environment; within which a variety of design elements and techniques help communicate the information to the audiences as they experience the space. This research project particularly concerns how, and to what extent, the use of design elements in the form of new media and technologies, influences the ability of the exhibition to communicate the intended messages.

This research project stems from recognizing: (a) that museum exhibition techniques used to communicate a narrative depend on multiple sensory modes of communication, especially visual; (b) the increasingly interdisciplinary nature of the exhibition development process; (c) the current trend of new media and technologies in museum exhibitions to promote learning via audience interactivity; and (d) the relatively undefined role of the designer in the development process.

Within a larger framework of exploring the system of representation in museums as social/cultural institutions, this study looks at museum exhibitions as products that are a result of cross pollination between museum practice and design. Museums provide the context and exhibitionary purpose, while design provides the framework and technique for representational materialization and communication.

This topic is important at this time and deserves thorough investigation, given the prevalent influence and authority of museums in knowledge formation and dissemination through material culture (Hein, 2000). A recent American Association of Museums survey indicates 87% of respondents deem museums trustworthy while 67% trust books and only 50% trust television news (Marstine, 2006, p. 4). In addition to the authority associated with museums, there is also an issue of authenticity and virtuosity. People often regard the content of a museum as "not only real but [as representing] a standard of excellence" (Cameron, 2004, p. 66).

However, museums have increasingly incorporated new media and technologies in their exhibitions to compete with other sources of information and recreation, as well as

technological advancement (Alexander & Alexander, 2008; McLean, 2004). This inclination towards the integration of technology usually involves different schemes of representation, namely visualization and simulation (Brett, 1996). It focuses on incorporating immersive and sensory-stimulating qualities within an exhibition to achieve an experiential appeal. The trend is often deemed as market driven in that it prioritizes entertainment over education, and is therefore referred to as "edutainment or infotainment" (Preziosi, 2006, p. 70).

Statement of Problem

Though it stems from the museums' long-established abilities to teach by showing, the trend towards technological interactivity in exhibitions is not without its ramifications. In aiming to elicit visitors' emotions through new media and technologies, the design and technological components potentially change the nature and purpose of the objects on display (Hein, 2000, p. 67). More specifically, each medium chosen to represent the curatorial intent and convey the messages, in fact comes complete with its own independent discourse. To understand how the trend towards technology integration could affect the messages conveyed in an exhibition, and therefore audiences' interpretation, it is important to consider David Brett's (1996) explanation of the technologies of representation.

> ...The technology [of representation] is not a neutral medium through which, transparently, a message passes unaltered from sender to receiver. It is itself a participant in the creation of meaning. This is true in both a shallow and a deep sense. The same event, described through the spoken word, the written word, the drawing, the photograph, the panorama, the tableau, the theatrical performance and the film, is delivered, experienced and understood through different senses and capacities, and according to different conventions.... They each imply, and are embedded in, systems of construing the world. Each technology of communication and the medium it employs is, in this respect, what Ernst Cassirer describes as a "symbolic," in which values and assumptions are inscribed prior to any putative message. (pp. 61-2)

These various technologies of representation thus have a formative power over the exhibition content (Brett, 1996, p.7). For the purposes of this research the term *design elements* is used to encompass numerous technologies of representation, entailing design components and techniques as well as new media and technologies. In addition to artifacts as corroborative means to the curatorial interpretation, design elements as media of communication can lead the audiences to overlook "the highly mediated and ideological character" of historical content presented in the form of narrative (Brett, 1996, p. 4). Therefore it is timely and important

to investigate the potential as well as the risk of this shifting focus within exhibitions in the pedagogical and respected institutions of museums.

Research Objective

The objective of this research is to examine and elucidate the use of new media and technologies in the CWM's permanent exhibition. It will help determine the influence of design elements on the ability of the exhibition to convey narrative meaning to the audiences. To understand how the communication strategies of museum exhibitions are supported by and/ or result from design decisions, this research requires looking at design-related choices in the development process–the principles, media, and techniques used to create a narrated interpretive environment.

Research Questions

To address the central issue, which is the influence of design components and technology integration on the communication of the exhibition's messages, specific questions to investigate design-related choices in the development process are: (a) What is the role of design in narrative exhibitions? (b) What are the effective design principles and techniques used in communicating information to the audiences? (c) What are the benefits and constraints of the use of design elements? (d) How do museums assess the success (the accuracy and effectiveness of the communication) of their designed exhibition? (e) Who holds the authority regarding what is communicated and/or what visitors experience in an exhibition? (f) Given the interdisciplinary nature of exhibition design, is there a way to simplify or streamline the process in order to minimize its complexity?

Research Approach

An investigation of the CWM's permanent exhibition requires an examination of the complex dynamics between three large concepts: museum exhibition, culture/history, and design intervention. To set the framework for this research, the terms and conditions under which the three key elements of the thesis topic are discussed, are clarified here. Donald Preziosi (1998) explains this relationship in *The Art of Art History*, in which he states, "Museums, in short, established exemplary models for 'reading' objects as traces, representations, reflections, or surrogates of individuals, groups, nations, and races and of their 'histories'" (p. 509). Design,

in this study, is considered to be a technique of rendering cultural/historical interpretation in *objective* form (Mitchell, 1998). For the purposes of this research, the three principal purposes of design elements have been identified as: to convey the exhibition's messages, to engage the audiences, and to represent the subject matter.

Notwithstanding the larger scheme of this investigation, the main area of concern is the relationship between curatorial intent, interpretive content, and design components and techniques. The three elements come together as a deliberately designed narrative space, which can be viewed as a form of representation to convey messages. Representations, which are never neutral even in the most benign cases (Brett, 1996, p. 2), can, without a doubt, affect the intended messages. Beyond that, this research is based on a belief that "exhibitions and displays are created by organizations that have particular values and assumptions inscribed in their products" (Brett, 1996, p. 12).

The thesis addresses the central issue–the impact of design elements on the communication of the messages in narrative-oriented exhibitions–from a designer's point of view. This is because the area of study is situated within the field of design. The researcher's intention is to understand the social phenomena of museum exhibitions. To attend to the complexities and elements of uncertainty involved, the researcher acknowledges the subjective and discursively laden nature of narrative-oriented exhibitions. In examining the CWM's permanent exhibition, the researcher thus pays particular attention to key interpretive elements of historical data, constructed narrative, curatorial intent, and exhibition's messages.

To deal with the interpretive nature of the object of study, this research project mainly takes a qualitative approach to examine the case of the CWM's permanent exhibition. The CWM's permanent exhibition was chosen for this research for several reasons. First, in presenting war histories from a Canadian perspective through the use of narrative, the permanent exhibition contains key study elements relevant to this research project, namely ubiquitous design and technological components; identifiable exhibition themes and messages developed through curatorial interpretation; and an historical narrative. Second, the permanent exhibition is divided into four separate galleries (referred to as zones at the CWM) Each zone contains a different theme and period. This facilitates identifying the exhibition-message structure and hierarchy,

particularly in performing descriptive visual analysis Third, the 2005 opening of the CWM's permanent exhibition also renders it contemporary and relevant to today's audiences

The use of design elements in the case of the CWM's permanent exhibition is studied at two levels A macro-level examination is mainly explored through semi-structured interviews with museum professionals involved in the development of the CWM's permanent exhibition In discussing work practices and insights gained from their experience with participants, this approach focuses on the role of design in museum exhibitions, key considerations and limitations of design elements, and other issues related to the complex development process This provides a solid understanding of both narrative-oriented museum exhibitions and the CWM's permanent exhibition, while serving as a basis for analyses on a micro level The micro-level investigation is carried out using both quantitative and qualitative research techniques Two investigative methods, (a) an analysis of the audiovisual and new media (AV/NM) database and (b) a descriptive visual analysis of selected AV/NM units within the permanent exhibition, are used in conjunction with the interview findings to triangulate the overall results of this research

Definitions and Rationales

To examine the CWM's permanent exhibition as the research object of study, it is imperative to understand what type of museum exhibition it is, as well as the key players and elements in developing such an exhibition

Museums and narrative-oriented exhibitions. With all the changes that are happening within and surrounding museums, to define what a museum is has become more challenging than ever Preziosi (2006) notes, "we inhabit a world where virtually anything can be contained in a museum, and where virtually anything can convincingly (or not) serve as a museum" (p 69) This is currently important considering how new media and technologies have enabled museums to exist and exhibit without any artifacts and/or entirely on a virtual basis

From a functional view, the International Council of Museums (ICOM, 2008) defines a museum as "a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment " Although there is an attempt to generalize and encapsulate the value and

function of any museum, various types of museums do exist. A few common types include art museums, science museums, history museums, and children's museums; the CWM is a military history museum.

Regardless of a museum's content, most museums, by and large, communicate to their patrons through exhibitions. Kaplan (1999) defines museum exhibitions as "products of research, [which are] organized and designed to convey ideas" (p. 37). Exhibitions, as forms of interpretation, communicate through the senses with their primary focus on visual perception (Cameron, 2004; Alexander & Alexander, 2008). For example, in the CWM's permanent exhibition a variety of graphic elements occupy a large proportion of the four zones under investigation.

To better classify museum exhibitions, it is imperative to take into account what they aim to accomplish (Edson & Dean, 1996). For the purposes of this thesis research, the CWM's permanent exhibition is considered to be concept oriented, and more specifically narrative driven. This classification is based on its intent and the use of its collections. The CWM essentially focuses on telling a story (cognitive and/or affective) with the aid of artifacts. This is demonstrated by the ubiquity and dominance of visual graphic wall panels and other media to impart and/or support the narrative throughout the exhibition. This exhibition type is different from an object-oriented exhibition, where the focus is more on the collections on display, as in fine art museums.

The concept of narrative. It is beneficial to discuss the concept of *narrative*, considering the significance of the narrative or story line to the CWM's permanent exhibition. This will help to later analyze certain design elements that serve to enhance the narrative while ultimately communicating the intended messages. Brett, who analyzes the construction of heritage (employing a research framework and subject similar to those in this thesis), regards the narrative as a critical alignment of historical data and interpretation.

> The very concept of narrative is, when applied to historical data, problematic. The essential question is whether or not the "narrative" is a feature of the studied reality (one might wish to call this *narrative realism*), or whether or not the narrative is a cognitive device which unifies and makes coherent a mass of data whose interconnections are otherwise very difficult to explain (this would be *heuristic narrative*). Allied to this is the necessarily narrative character of language and the story-telling function inseparable from describing events. (Brett, 1996, p. 5)

Regardless of how one views the concept of narrative, what is critical to this thesis is the narrative types that exist. Jerzy Topolski (1987), a historian who wrote "Historical Narrative: Towards a Coherent Structure," classifies narrative into three main kinds: annal, chronicle, and scholarly narratives. He also notes that these narrative types are *ideal constructs,* which rarely occur in their pure forms, and hence one likely only exists as a mix of types:

> The simplest of all is the annal. This typically exists in the form of simple statements in chronological order. "In this year the Vikings came. They burnt the monastery." ...In such bald accounts, no general concepts are developed, though the statements in some general sense embody a picture of the world. There is no appeal to previous statements and other known facts. The principle of selection is extremely basic.
>
> The second type is the chronicle. This introduces rudimentary ideas of causality and a hierarchy is placed over the facts–some are more important than others. This is significantly more coherent than the annal, because the reality described includes not only events but also relations between events. In addition, the chronicler knows what has happened before and uses that knowledge; she or he has therefore a time sense that includes retrospection as well as mere sequence. Thus a structure of explanation becomes possible. Many television documentaries take this form.
>
> The third type is the scholarly narrative. Here the writer and reader can look both forward and backward along the direction of time, being both retrospective and prospective; facts are integrated into wholes in terms both of causality and inference, giving an altogether higher level of coherence. Facts are presented in terms of the consequences that flow from them. (as cited in Brett, 1996, pp. 5-6)

In addition, Topolski (1987) believes that these narrative types, which can be considered horizontal structures, also contain the vertical layers of any one narrative, in which lie the *deep principles*. They are theoretical bases that are neither necessarily apparent nor articulated (as they can be experienced as something assumed) and they control the selection and classification of the material in constructing the narrative. Brett (1996) further explains that these underlying principles "include not only deep theoretical assumptions but also literary and other models, the conventions of representation in other media, and matters left unsaid because it is expected that the reader shares them" (p. 6). Brett also asserts that although only scholarly narrative acknowledges this order of *self-conscious fashioning*, all narrative types share this layered structure.

With the focus on conveying the consequences of the Wars and how they have shaped Canada, the narrative of the CWM's permanent exhibition can be considered as mainly the scholarly type. In chronicling Canada's military history from the earliest times to today's operations, there are both retrospective and prospective elements. Underneath the main story

line lie the four major themes: Geography, Politics, Brutality, and Survival. Brutality as one of the predominant assumptions about war has been incorporated as a main element of the narrative, which is to bring the story of conflict to life as well as to instill in visitors the human side of war.

Another important aspect of the concept of narrative is that the narrative, although based on textual research, cannot simply be subjected to textual analysis. This is because the narrative is conveyed through various media in an exhibition: objects, images, spaces, and more than ever and central to this thesis, new media and technologies. "Objects, pictures, and spaces do not behave in the mind as do words; our experience of them is always in some large measure 'preconceptual'" (Brett, 1996, p. 7). This notion thus validates the intended investigative method of descriptive visual analysis for this research, which is later discussed.

Exhibition development process. The CWM's permanent exhibition is approached in this thesis as the end product of an interdisciplinary process with a focus on its development phase. This development phase is one of the four main stages (conceptual, development, functional, and assessment) in an exhibition process as shown in Figure 1. According to Edson and Dean (1996), there are three types of activities that occur during these four stages of an exhibition project. They are: "(1) Product-oriented activities–efforts concerned with objects and interpretation; (2) Management-oriented activities–tasks that focus on providing the resources and personnel; and (3) Coordination activities–keeping every job moving toward the same goal" (pp. 161-2).

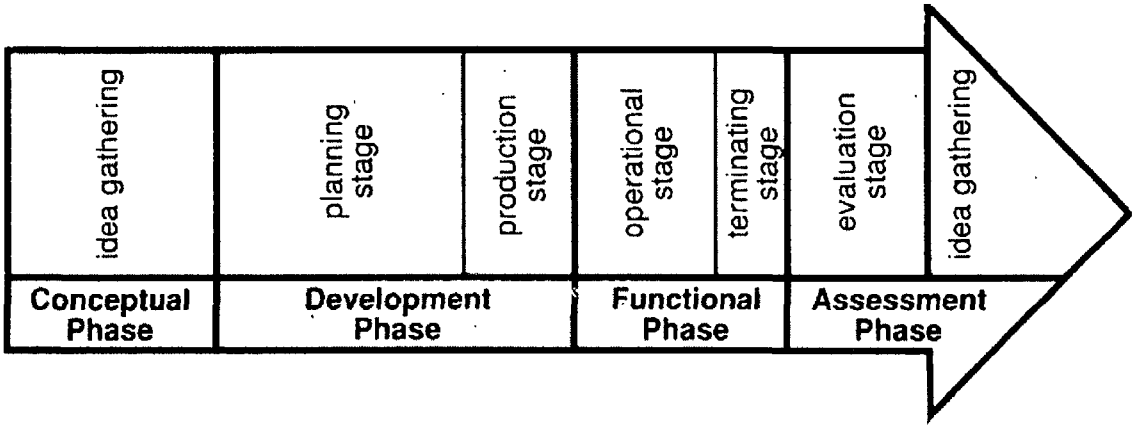

Figure 1. Four phases of the development process of a museum exhibition. Adapted from "Exhibition Project Model," by G. Edson and D. Dean, 1996, *The Handbook for Museums*, p. 162. Copyright 1996 by Routledge.

Within the development phase, there are two stages planning and production During the planning stage, many activities occur, such as establishing exhibition goals and objectives, "researching the topics, writing the interpretive materials, designing the gallery, and creating educational and promotional plans" (Edson & Dean, 1996, p 164) This stage also entails planning and making decisions about design components and techniques that best delineate the narrative and thus communicate the exhibition's messages Many product-oriented activities take place during the production stage, some of which are borrowing objects for exhibitions, continuous record keeping and documenting, fabricating graphics, building display structures, and installing artifacts and lighting (Edson & Dean, 1996, pp 165-6) With the exhibition trend towards incorporating design components and technologies for sensory experiences, this also includes activities such as producing audiovisual materials, and testing and integrating new media In addition, there are management-oriented activities such as quality control in the form of the approval process throughout the progression The investigation of the design elements used in the CWM's permanent exhibition entails both planning and production stages within the development phase

Key players. Developing an exhibition as a collective creative activity with the intent to communicate (Edson & Dean, 1996, p 152), often involves three key players the curator (or *historian* in the parlance of the CWM), the interpretive planner, and the exhibition designer This critical triadic collaboration is illustrated in the interview accounts (which is further detailed in the Research Findings chapter) as well as through the professional experiences of the author of this thesis

The curator/historian, with his/her expertise in the subject matter (collections and historical data), is responsible for selecting content and developing interpretive concepts for the exhibition These concepts, in the form of narratives, are embedded in the messages the museum intends to communicate to the audiences The following excerpt discusses the role of interpretive planner (also referred to as exhibition or content developer) in general

> The planner works closely with curators, designers, and educators to develop comprehensive plans [He/she] develops and recommends concepts and interpretive strategies for individual exhibitions, and exhibition complexes The planner executes the research required to write exhibition [story lines] and selects the artifacts, specimens, photographs, and graphics to visualize that [story line] The planner works closely with curatorial staff and content consultants to ensure that the scholarship and information are accurate, timely, and appropriate for delivering the educational objectives of the exhibition

> and of the museum. The ultimate product the planner is responsible for is a written script and an object and graphic inventory in a form and content appropriate to guide the design and production of the exhibition. (Glaser & Zenetou, 2004, pp. 95-6)

However, June Creelman (personal communication, March 5, 2010), one of the interpretive planners of the CWM's permanent exhibition, states during the interview that the planner's responsibilities could vary depending on the museum's structure and organization. In the case of the CWM, the historians created the content and therefore were the main authors, however, the planner was in charge of interpretive strategies, including content and theme grouping and setting limits on information and its hierarchy. The exhibition designer is also a key player as more museums take the team approach to planning exhibitions. In collaboration with the curator and the interpretive planner, the exhibition designer materializes conceptual ideas for the production of an exhibition, which traditionally involves "renderings, drawings, scale models, lighting, arrangement of objects, and signage" (Edson & Dean, 1996, p. 21; Glaser & Zenetou, 2004, p. 94).

New media and technologies. In addition to the conventional physical displays that help translate the curatorial interpretation (constructed narrative) into physical form, there are other relatively new forms of presentation, which are largely enabled by technological advances in reproduction (Brett, 1996), archival (Ersnt, 2000) and design techniques. Paired with the intention to create entertaining sensory experiences for wider audiences, new media and technologies are being increasingly introduced and integrated into narrative-oriented exhibitions. This can be seen in the form of sensor-activated audiovisuals and touch-screen computer interactivity (McLean, 2004). These new forms of presentation can be defined as "a set of tools and technologies... used to create new applications or perhaps even enrich existing ones through the merging of sounds, moving images, graphics, animation and computing, under the control of the user" (Fahy, 1999, p. 89).

This research mainly considers exhibition elements in addition to the collection on display and its textual description (both artifact labels and larger text panels). It excludes the design of the exhibition setting (lighting, space layout, and artifact arrangement). Thus, the focus is on design elements that help reinforce the connection between the collection and the narrative, and serve to communicate the exhibition's messages by holding the attention of the audiences and appealing to people's emotions and senses.

Scope

Given the research focus on the influence of design elements on the conveyance of the messages of the exhibition, the scope of this study is limited to the relationship between representation and curatorial interpretation in an exhibition Audience interpretation of the intended messages is thus beyond the scope of the intended investigation

This research project is both interdisciplinary and exploratory in nature First, this research takes an interdisciplinary investigative approach The work produced is a result of guidance from multiple disciplines, namely Industrial Design and Art History The annotated-bibliography style of the literature review in the following chapter demonstrates the interdisciplinary nature of the research Second, by having an exploratory approach to the research, this thesis mainly aims to develop direction and insight into the CWM's permanent exhibition The researcher's familiarity with the content of the exhibition through previous work experience and visits to the museum also serves as preliminary research allowing for a deeper investigative approach

Literature Review

This chapter reviews literature about changes in museum exhibitions and their implications, specifically concerning the use of new media and technologies. In addition to demonstrating the value of this thesis research, the literature review helps examine the central issue of design and technological influences in narrative-oriented exhibitions. As background research, the selected literature also assists with the investigation of the CWM's permanent exhibition. This chapter is presented in the format of an annotated bibliography, adopted from the approach taken in the field of art history. The included literature is divided into two sections, one relating to the trend of technology integration and the other focusing on the notion of museum exhibitions as communicative media.

The Trend of Technology Integration

To delineate the changes in museums and the way they exhibit, ultimately leading to the rise of new media and technologies in museum exhibitions, the section to follow contains three different views on the trend and its implications The selected literature represents the spectrum of opinions on the issue.

The museum in transition. Hilde S. Hein (2000) critically reviews the changes that museums have undergone over the last few decades in her book *The Museum in Transition: A Philosophical Perspective*. To explain her investigative approach, Hein elaborates on the relations she sees between the abstract nature of ideas in philosophy and the materialistic fundamentals of museums and their collections; "For objects, as I understand them, are ideas reified. From a philosophical perspective, particular things, including embodied structures, physical states, actions, and events, are actualized thoughts" (p. vii).

To Hein, museums are sites of ideated expression and more important, contemplative spaces where comparative freedom and security exist. Despite the limits of material representation and the subjectivity of multiple narrations, museums allow visitors to partake in the objects' histories while reflecting on them imaginatively. Hein's intent to study the changes in museums stems from her own conviction that museums are shifting focus, from object centric towards experience making, which has profound consequences on the founding premises of museums. These ideas serve as the basis of Hein's argument.

Hein posits two causes for museums transforming from knowledge-imparting institutions to experiential narrative spaces. One is that collected objects alone are no longer sufficient to stimulate learning, and specifically to engage visitors' attention; thus the need for narrative experience in the form of interactive media and technologies. The other is that museums, in becoming public institutions, have somewhat prioritized people and their values over the significance of objects. Hein observes that design elements and simulative technologies have increasingly overpowered the collections in current exhibitions, as is made evident by the prevalence of physical interactive, graphic displays, and multimedia. These changes have consequences on: the museum visitors' interpretations, the collected objects, the exhibition itself, and the underlying premise(s) and authority of museums as pedagogical institutions.

First, Hein questions the validity of each visitor's personal and subjective interpretation of reality derived from the contrived (designed) exhibition experience. Hein regards the trend of technology integration as the museums' attempt to control "the conditions under which visitors can be expected to have the experience" (p. 66). Hein's main criticism has to do with the inclusion of new media and technologies for experience making, which has been widely adopted and/or implemented without having established a clear set of standards or proof of the value they add to the experience. Hein compares the trend to the traditional collections of objects:

> In the past, collections of objects were valued according to such discipline-specific standards as rarity, typicality, historical importance, beauty, or representative merit. As yet, no set of clear criteria has been defined to judge the quality of experiences. Their inherent privacy makes experiences less accessible to interpretation and evaluation than objects, which have an ostensible public face. (pp. 66-7)

Second, with the museums' focus on making experience via technologies, the collected objects, more than ever, become means to corroborate the curator-constructed narrative. The objects themselves potentially lose their factual integrity as their own provenance and meanings become secondary to their effect on the presented subject.

Third, the trend towards technology integration also affects the exhibition itself, particularly its purpose. Exhibitions are no longer conceived as solely conveying information on the subject, but instead as stimulating an affect or experience for the visitors through the integration of new media and technologies. To Hein, this could lead to the reconceptualization of authenticity in which the audiences interpret exhibition-evoked feelings and simulated

experiences as the *real thing*, and not "the [collection] of historically legitimated objects" (p 66) Hein discusses two additional implications of experience-oriented exhibitions (a) a change in the communication style of the exhibition, through which the story is "elicited rather than told" (p 65), and (b) a change in the definition of an exhibition, where the collecting and displaying techniques are replaced by the experience-making technologies

Fourth, Hein believes that the trend towards technology integration and experience making could lead museums to trivialize their own collections, which in turn could hinder their didactic authority Hein explains that the authority museums enjoy today is a direct result of their traditional epistemic homogeneity and the former prevailing attitude on the singularity of truth This can be seen in the conventional form of linear narrative structure, expressed in the prescribed flow of the exhibition space, which often does not leave very much room for interpretation (Witcomb, 2003) With the pluralistic nature of experiential exhibitions and little knowledge of their effects on the audiences, Hein argues that modern museums could have relinquished such authority, as there "seems to be a growing consensus that heartfelt experience is somehow more honest and universally more accessible than culturally weighted objects and meanings" (p 68)

The impact of media and interactivity. In contrast to Hein's view, Andrea Witcomb (2003) presents a more moderate view on the trend of technology integration in museum exhibitions in her book, *Re-Imagining the Museum Beyond the Mausoleum* Witcomb's work attempts to both understand and explain the contemporary debate surrounding the changes in museum practices Witcomb's approach consists of three strategies researching background information on the issues, grounding the discussions with specific examples, and using the discussions "to speak back to the critical literature on museums" (p 3) This literature review focuses on the last two chapters of Witcomb's work where the author discusses the impact of media and the notion of interactivity in museums It is apparent that although Witcomb sympathizes with Hein concerning the trend's impact on the object's status in museums, she also sees advantages in the changes

Concerning museums and the media, Witcomb recognizes that museum objects are potentially being displaced by electronic technologies as museums are transforming from temples (treasure houses) into forums (information centres) Witcomb attributes these changes to the

democratization of social relations rather than the end of material culture and provides two reasons for the changes The first reason has to do with the prevailing pluralistic view of modern society, which unravels the museums' authority and convention of classifications and taxonomies Witcomb alludes to "the emergence of the New Museology, a field of study which critiques museum practices in relation to their social, economic and political contexts" (p 103), to illustrate how the museums' absolute claims and authority are being challenged This has especially to do with the objects' meaning in the form of homogenic discourse presented in their exhibitions The second reason for the changes is the ubiquity of electronic technologies and the growing impact of media Witcomb claims that the trend of technology integration "has brought widespread changes to contemporary museum practices" (p 103), particularly to the status of objects within museums in terms of their authority to speak or mean The impact can be seen on a practical level where current exhibitions consist of non-collected objects such as multimedia applications and other design elements, and also on a discursive level where these new media make the museums' content available beyond their walls, making museums readily accessible and popular

According to Witcomb, there are two main implications with the changes towards new media and technologies in museum exhibitions First, it has to do with the potential for more social interaction and the issue of accessibility The author refers to Marshall McLuhan's idea to explain the potential for more social interaction, which considers the nonhierarchical communication style of electronic technologies to be conducive to social interaction (pp 108-9) Witcomb then discusses George MacDonald's (1987) argument about the issue of accessibility As the former director of the Canadian Museum of Civilization Corporation (to which the CWM belongs), George MacDonald advocates the use of technologies in the form of experiential exhibitions where the objects are not separated from the viewers (as cited in Witcomb, 2003, p 114) This is to help museums remain relevant in the modern *information* society With less focus on the objects in exhibitions, museums no longer need to make absolute claims Exhibitions thus can be more open to interpretations with the aid of exhibition techniques such as graphic images and audiovisuals Second, the changes towards technology integration induce the rise of constructed narrative and the virtual museum To Witcomb, virtual museums are means to promote access and democracy They also bring many advantages, including overcoming the museums' authoritative role and perception, lessening the gap between museums and their audiences, and updating the exhibition content

In the last chapter of her book, Witcomb turns to examine interactivity in museums as a result of technology integration in exhibitions She discusses the Museum of Tolerance in Los Angeles, the Australian National Maritime Museum, and the Museum of Sydney as examples Witcomb finds that it is not necessarily the technologies used that drive the interactivity in museums, but rather the narrative structure Traditionally, she argues, exhibitions have been designed to communicate a single, linear narrative, which is then supported by spatial arrangements and artifact displays expressed in a one-way flow of the exhibition space Witcomb asserts that the interactivity via technology integration does not guarantee a change in the one-way communication, but a reconceptualization of exhibition spaces does The Museum of Tolerance in Los Angeles serves as an example There, interactive technologies are incorporated only to reinforce the one-way communication of the intended messages The Australian National Maritime Museum shows the shift from "a linear, chronological understanding of historical representation" (p 141) However, it also has had issues with individual confusion and difficulty in ensuring a collective understanding among various visitors Witcomb also discusses the other end of the spectrum of interactivity in museums by using the case of the Museum of Sydney, where there is an attempt to create a *dialogic interactivity* (shared communication) The conditions essential to such an intention include acknowledging the fragmentary nature of history (Ernst, 2000, Geertz, 1973) and accepting multiple interpretive voices (Hooper-Greenhill, 2006) The problem that comes with this approach is that in the pursuit of democracy museums potentially exclude the general public, as this type of exhibition often requires more background knowledge on the part of the audiences to form their own interpretation and can therefore become less accessible

Witcomb considers *narrative* as a design issue In this she presents an idea similar to the one given by Hooper-Greenhill (2004) Witcomb emphasizes the need to see communication as a two-way process, which is without a predetermined discourse in order to allow the visitors themselves to process information and produce their own meanings (p 143) This consideration thus leads to designing smaller theme/display units within an exhibition that stand on their own and arranging them in a meandering manner, which is less controlling than the linear style Witcomb notes, "The difficulty for those museums who wish to be less didactic and more interactive is to achieve a balance between multiple points of view while maintaining an editorial line which is not reductive" (p 156)

New technologies for museum communication. In comparison to Hein and Witcomb, Anne Fahy (1999) takes a different position in her article, "New Technologies for Museum Communication." Fahy seems more ready to accept the trend of technology integration and considers its potential on three levels: within the museum, among museums, and beyond the museum to "the academic community and the public" (p. 86).

Within the museum, Fahy discusses the effects of new technologies in terms of museums and information. She explains that traditionally the services provided by museums have been object-based activities such as exhibitions, which can be highly subjective. However, the information associated with the collected objects is becoming more significant with the changes towards a more democratic approach in curatorial interpretation. New technologies, in the form of automated documentation systems, greatly facilitate this need by making both the collections and their information more readily available. Fahy asserts that:

> While it is true that objects are central to the museum, indeed they are what sets the museum apart from other leisure and educational attractions, the importance of the objects lies in their cultural or environmental significance. Axiomatic to this is the need to record the significance of the object in a manner [that] is usable and can be protected for the future.... The real value of museum is in the preservation not so much of the objects themselves, but of the information relating to them. (p. 83)

To demonstrate how new technologies can be of benefit within the museum community, Fahy refers to the museum network–the Canadian Heritage Information Network (CHIN)–which was established in 1972 and currently combines more than 100 separate databases from museums in Canada. New technologies are therefore critical to this type of change, particularly in terms of research process. Beyond the museum's walls, Fahy looks at the impact of new technologies (interactive multimedia). She comments on the existence of various forms of interactive devices and that much has already been written about them. Nonetheless, she still considers "interactive devices [as having] an active and important role to play in the communication process" (p. 89). The main advantage Fahy sees in new technologies (hypertext and hypermedia) is the possibility for users to access information in a nonlinear way (similar to McLuhan's idea as expressed by Witcomb) through links, which is more similar to the way we think. With interactive touch screens, for instance, users are able to jump between sections (p. 91); this is in contrast to the traditional analogue mode of interactivity in museum exhibitions.

Fahy posits four key issues in adopting new technologies in museum exhibitions. The first has to do with well-defined aims and objectives for the application–"how it interacts with the rest of the exhibition and a view of its target audience" (p. 92). This issue of appropriateness in both the purpose and the use of the application is critical to each application's success. The second concerns evaluating and measuring the effectiveness of the application during the front-end, formative, and summative stages. The third involves "the robustness of hardware and software" to prevent any malfunctioning physically and to ensure that the application's interface is accessible and user friendly. The last concerns the curatorial control of information. Fahy acknowledges that in practice it would be too time consuming and costly to develop applications that are broad and deep enough to allow the user to depart from curatorial judgments. However, she still encourages the use of new media to allow more democratic approaches. Fahy states, "Computerized interactives [sic] could, in theory, be an ideal tool for allowing the public access to information which has not been 'processed' by the curator" (p. 93). Ernst (2000) shares Fahy's idea that the technological advancement could allow the exhibition's content to be presented in an *au naturel* way. This implies less consummate interpretations from the curator, as fragmented cultural/historical data can be more networked and less developed.

Museum Exhibitions as Communicative Media

Much of the literature suggests that the trend towards technology integration in museum exhibitions is accompanied by a change towards considering exhibitions as communicative media instead of as conventionally didactic. The following section includes three authors' emphases on how museums and exhibitions alike increasingly play the role of communicators. More important, it addresses each author's view on the implications pertinent to this role change.

Rethinking communication and learning. In the article, "Changing Values in the Art Museum: Rethinking Communication and Learning," Eilean Hooper-Greenhill (2004) offers a new perspective on museology and reinforces the reconsideration of the role of museums as communicators. Hooper-Greenhill first discusses the perceptions people have of a stereotypical museum and the challenges current museums face to justify their existence. Hooper-Greenhill explains that with reductions in funding, many museums resort to marketing, promoting entertainment and experience aspects in museum visits. These changes necessitate a rethinking

of museum exhibitions as communicative media She puts forward two ways of analyzing the communication of museum exhibitions as a process of transmission and as a part of culture

First, Hooper-Greenhill refers to the transmission model of communication to help explain the museums' approaches to their exhibition development According to Hooper-Greenhill, there are several issues with the current practice of modern museums Exhibitions are often developed based on the curator's knowledge and decisions without much consideration of the audiences, the audiences are in fact "rarely defined beyond the catch-all general public" (p 562) The current communication process is often one way and from the technical-process perspective (involving mainly object selection, artifact arrangement, and space layout) The focus on technology in exhibitions thus not only neglects the social and cultural aspects in communication, but also excludes visitors' preferences There are two challenges modern museums face–"The first concerns what is said and who says it, issues of narrative and voice The second relates to who is listening, and is an issue of interpretation, understanding and the construction of meaning" (p 563)

Second, in looking at exhibition communication as a part of culture, Hooper-Greenhill discusses the importance of the interpretation process–the construction of meaning She emphasizes that this approach largely depends on "how culture is defined and how social interactions are conceptualized" (p 565) She explains, "The process of constructing meanings is like holding a conversation No interpretation is ever fully completed There is always more to say, and what is said may always be changed" (p 566) Like Weil (2002), Hooper-Greenhill also acknowledges the notion of *entrance narrative* (each visitor's variable preconceptions) and how it contributes to different meanings

Like many authors (Baxandall, 1998, Ernst, 2000, Weil, 2002), Hooper-Greenhill advocates the need for visitors to construct their own interpretation of an exhibition, and therefore argues for less control by the curatorial staff However, further research is recommended to investigate how far interpretive strategies, including narratives and design, influence the visitors' actual interpretations In the end, Hooper-Greenhill encourages museum curators to embrace changes by taking on new approaches to lessen the gap in the museum-audience relationships There are four suggested changes (a) the involvement of new professional roles from various disciplines, (b) the recognition of differentiated audiences, (c) the introduction of new voices as a

result of acknowledging the diversity of the audiences, and (d) the development of new narratives that are less complete and more open to various interpretations.

The dynamics of dialogue. In the article, "Museum Exhibitions and the Dynamics of Dialogue," Kathleen McLean (2004) offers her view on the changes museum exhibitions of all types are experiencing. McLean particularly looks at the dynamics of communication through the exhibition between museum professionals and diverse patrons. Her concern about exhibitions involves "the inherent dialectic between the intentions of [the] presenter and the experiences of the spectator" (p. 193). McLean questions the nature of exhibition as the act of showing/ presenting–who is presenting what? for whom? and why? Similar to Brett's mention of deep principles, McLean believes that the presenter's intentions and values as they are embedded in the exhibition are often opaque.

Like Hooper-Greenhill (2004), McLean attributes competition with the private sector for the public's leisure time as a driving force in technology integration in museum exhibitions:

> In the rush to attract more visitors, exhibit professionals across the country are making profound changes in their exhibitions–expanding their range of exhibitable [sic] and often controversial themes and experimenting with new exhibition techniques and styles of development. Exhibitions are increasingly filled with interactive elements, multimedia and networked technologies, catchy and conversational labels, and objects out from under the glass. (p. 194)

Nonetheless, McLean still notices some resistance, especially for those who deem museums as temples of knowledge. The concern is mainly to do with creating entertainment at the expense of learning. McLean suggests that the trend of technology integration has led "museum professionals to an almost obsessive self-reflection: What value does the museum, as a civic institution, bring to the social mix? Where is our unique niche?" (p. 195).

With regards to the audiences, McLean briefly discusses the science of visitor research. She notes that "Research on how and why visitors use museums has played a major role in helping to turn exhibitions into more connected two-way conversations" (p. 196). As for the changes on the curatorial side, McLean provides several early examples of museums that took on an open and hands-on learning approach to their exhibitions, such as the Boston Children's Museum. McLean also mentions a change in exhibition team composition–members are becoming more interdisciplinary due to the market-driven emphasis. She comments, "While team

proponents consistently pointed to mutual appreciation among team members as a significant outcome of the process, there was no discernible improvement in the quality of exhibitions developed by teams" (p. 201).

In the second half of her article, McLean discusses many new implications for museum exhibitions as communicative media. She makes four major points. First, in acknowledging the dialogue, there is a need for a forum for exhibition review of design-based issues such as aesthetic, form, and experience. This is to ensure the appropriateness of different media and the overall effectiveness of communication between the exhibition and visitors. Second, exhibition creators are becoming expert generalists able to synthesize work from various disciplines. More important, they are communicators "dedicated to sustaining the relationships and enriching the conversations between exhibition and visitor" (p. 205). This underlines the increasingly interdisciplinary nature of exhibition development. Third, it is important to keep permanent exhibitions relevant during the entire time they are open to the public. Fourth, given limited resources, museum professionals need to be more efficient and collaborative in sharing "the effort and expense of costly exhibition development, particularly for... interactive multimedia" (p. 207).

Concerning the debate on the museums' transformation, McLean argues that museums are both temples and forums as "exhibitions are about people communicating with each other" (p. 209). McLean subsequently asserts the importance for museums to embrace the inherent tension of the dialogue between experts and the visiting public, while cautioning that:

> As exhibitions pull away from the curator's grip, the momentum may have swung us too far in the other direction. The effects of splitting off the researchers and content creators from the public presenters have, in some instances, forced museum exhibitions to lose their essential relationship to the pursuit of inquiry and the world of mind in favor of a superficial and simulated experience much more connected to the world of mindlessness.... Defining "entertainment" with the mind-set of a scholar or "education" with the mindset of a theme-park operator does a great disservice to the complexity and sophistication of our audiences. (pp. 208-9)

Museums as new media. In the article, "Legibility and Affect: Museums as New Media," Michelle Henning (2007) presents her argument in terms of remediation, affect, multimedia, interactivity, database, and modularity. Henning considers the effect of introducing different media into museums as being "simultaneously banal and far reaching" (p. 25). Henning's argument is based on new media theory and "some of the ways in which current developments

resemble the exhibition experiments of the late 1920s" (p. 26). The author's intention is to offer some new ways of thinking about new media and technologies in museum exhibition design.

Henning's position on museums as communicative media stems from the concept of remediation, which refers to the interdependence between old and new media–"how media borrow from one another, and incorporate one another" (p. 27). Henning describes three ways in which museums can be remediated by new media. First are virtual museums including both the web sites that exist in parallel to actual museums and those that are solely online. Second is the use of technologies and new media such as touch-screen computer interactive to assist exhibitionary and archival purposes in museums. Third is in the way exhibition design mimics and appropriates new media conventions and styles; "In their use of diverse exhibitionary techniques, many contemporary displays take on a multimedia character similar to new media" (p. 27)

While discussing the affect of new media, in which technologies are used to produce feelings in museums, Henning points out a change in the purpose of technology integration over time. The use of affective spotlighting in the Museum of Society and Economy in Vienna in the late 1920s was to attest to progress and industrialization. The use of multimedia flourished during the world's fairs of the 1950s and 1960s at which time the museums provided the context and purposes for the new mass media to develop. Henning explains that this is because museums have exhibitionary, accumulative, and archiving functions. Henning, however, argues that the current trend of technology integration in museums is reactive–"responding to the pressures of the market and wider demands for hi-tech and interactive experiences" (p. 29).

On the subject of interactivity in museums, Henning explains that developments in interactivity for exhibitions occurred long before the introduction of computers to museums. The concept of user interaction can be seen in the use of participatory devices in science museums as early as the 1920s. Although the user is active in carrying out a participatory and affective experience, Henning argues that its effect is contrary to the exhibition creator's intention. Henning refers to Lev Manovich's theory on new media, which explains how technologies externalize the mind by standardizing the individual mental process. Computer interactive used in exhibitions thus provides the audiences with preprogrammed associations. Ultimately, the idea of

interactivity, "which seems initially to promise agency over 'numbed passivity,' actually does the opposite, increasing alienation" (p. 37).

Summary

Several of the authors of the reviewed literature share the idea that the trend of technology integration in museum exhibitions can be attributed to two main causes. One is the decrease in funding, which drives museums to increase their revenues by attracting wider audiences using new media and technologies to create entertaining and experiential values in museum visits. The other is the prevailing social norm to be pluralistic and democratic, which leads to the general public's questioning of the museum's authority expressed in the form of curatorial interpretation and exhibition. Many believe that interactive technologies would help attend to this need.

The quality of, and potential for, technology integration lies in its interactivity. To many (Alexander & Alexander, 2008; Fahy, 1999; Hooper-Greenhill, 2004; Jones-Garmil, 1997; Witcomb, 2003) the trend promises more social interactions both within and beyond the museums' walls. However, not all authors agree on the benefits of such a trend. For instance, Henning (2007) argues that such technologies actually elicit passivity from the audiences. These different views often relate back to the more profound issue of the museums' purpose in society/ culture and more specifically, of their transformation. While the debate on the role of museums either as temples or forums is beyond the purposes of this thesis research, the author of this thesis does not take a strong position on either side of the debate. The main intention is to explore and evaluate the potential consequences of the technology-integration trend. Taking into consideration the issues of narrative structure and communication style helps evaluate the use of design elements in the CWM's permanent exhibition.

Main Argument

This chapter discusses the values and implications of the use of new media and technologies in narrative-oriented museum exhibitions.

> Although in the last two decades of the twentieth century there has appeared an immense and useful literature on museums and museology, it has also become clear that significant progress in understanding the remarkable properties, mechanisms, and effects of museological practice remains elusive. (Preziosi, 1998, p. 510)

Despite the changes museums and exhibitions alike are undergoing, which may have rendered their roles and functions unclear, museums still play a vital role as pedagogical institutions in our contemporary culture. They are products of the Enlightenment, which means, according to Quatremère de Quincy, that they are vehicles to represent "a community of learning and knowledge, a concordance of taste, scholarship and industry, among the countries of Europe" (Déotte, 2004, p. 52). Museums, with their didactic pursuits, have honed a unique ability to teach by showing (Hein, 2000). Exhibitions as systems of representation have undergone a series of transformations from the Renaissance curiosity cabinets to the showcasing techniques of the Industrial Revolution (Greenhalgh, 1988). More recently, museum exhibitions have been subjected to the social urge to instill capitalist values of innovation and consumption via hierarchical arrangement of objects (Marstine, 2006).

The advance of technology, in many ways, has been and is still dictating the role and priority of museums and their exhibitions (Jones-Garmil, 1997; Roberts, 1997). This is axiomatic with the ubiquity of new media and technologies in today's museum exhibitions. There is currently an even higher expectation for more technology integration within museum settings as the demographics of museum audiences and their information-consumption patterns are changing (Alexander & Alexander, 2008, McLean, 2004). This expectation for more technology can be a financial challenge for many museums. Some traditional *static* design elements entail illustration, artifact labels, display arrangement, lighting, and dioramas. Now these techniques have also come to include physical interactive, graphic panels, multimedia applications, immersive experiences, and so on.

This trend of technology integration began in the mid-twentieth century. The introduction of technology to museum environments in the 1960s first served to facilitate collection management in the form of databases for cataloguing (Jones-Garmil, 1997). By the early 1970s,

technology was used in exhibitions to provide new and creative ways to impart information to the audiences. Collections had begun to share the floor with slide and film presentations, audio systems, and the first computer terminals (Roberts, 1997, p. 38). Hein (2000) notes that constant advancement in technology, affecting components and techniques of exhibition design, requires a continual and careful analysis of how it influences the audiences. To extend and update their role as educational institutions, museums gradually modify their style of delivery beyond the traditional display of objects in a rational order.

Sensory Approach

For the purposes of this research, the researcher takes into account three main sensory stimuli through the use of design components and techniques as well as new media and technologies. The three sensory channels are: visual, auditory, and tactile. Museums now appeal to their audiences with a sensory approach through technology integration to engage visitors with experiences. Kaplan (1999) explains:

> It is crucial to recognize that an effective exhibition is more than simply an idea, the objects and the installation.... An exhibition that communicates must educate and excite the mind and the senses; when communication is optimal it creates an "affect" among spectators and audiences. Affect happens when various exhibition elements combine in subtle and perhaps ultimately unpredictable ways for individual viewers, who are able then to cross an invisible "threshold" of cumulative, personal and cultural experience. (p. 41)

To many museum experts, the use of sensory stimuli entices and captivates audiences' attention. Multimedia applications, such as audiovisuals and touch-screen computer interactive, not only have the potential to put the narrative and the displayed collection in context for visitors; they may also enrich the visitors' learning experience. By eliciting visitors' participation, either psychological or actual, and combining sensory perception with rational analysis, these delivery styles better explain the exhibition contents (Alexander & Alexander, 2008). Psychologically, the range of choices of design elements helps diminish museum fatigue and boredom by adding appeal and change of pace to the exhibition (Alexander & Alexander, 2008; Hein, 2000). More important, technologies help relate objects to each other and produce meaningful visual narratives (Hooper-Greenhill, 2006). With the ability to create a broader and more cohesive picture, the sensory approach, as one of many exhibition design strategies, has become integral to communicating the messages in museum exhibitions, particularly in the narrative-oriented type.

The sensory approach, achieved through design in the form of interactive elements and networked technologies, can be a powerful tool in imparting knowledge and information, especially with its emotional appeal. However, it is important to remember that the sensory approach should only supplement and not replace the conventional means of words and verbalization. This is to prevent the audiences from getting caught up in such multisensory experiences, ultimately enjoying the effects more than paying attention to the objects on display (Alexander & Alexander, 2008). A good example is the so-called *pinball effect*–visitors actively interact with the provided hands-on exhibits without making an effort to understand the content or their messages (Roberts, 1997).

Implications of the Use of New Media and Technologies

In objects being replaced. With the dominance of new media and technologies in many narrative-oriented exhibitions comes "the deconstruction (or destruction) of the traditional exhibition cases and designs"; this also entails the cyber dimensions (virtual applications) for museum-to-visitor communication (Alexander & Alexander, 2008, p. 246). The prevalence of audiovisuals, touch-screen computer interactive, and online exhibitions best exemplifies this change. Though the omnipresence of technology integration in museum exhibitions emphasizes the importance of design for the interface of exhibition-audience communication; it may consequently devalue the significance of collected artifacts.

However, not everyone deems this a concern; online viewing of exhibition contents and collections, in fact, attracts wider audiences and encourages them to make actual visits (Jones-Garmil, 1997). Furthermore, the trend provides a considerable advantage in adapting to technological progress and changes in audiences' preferences and consumption patterns (Henning, 2007). Regardless of the medium and its form (either physical, technological, or virtual), Falk and Dierking (2004) posit the significance of appropriately designed exhibitions as "arguably one of the best educational [vehicles] ever devised for facilitating concrete understanding of the world" (p. 142).

Changes in authority. The prominent role of new media and technologies in museum exhibitions and their development also redefines the role of exhibition creators in general. The exhibition creators, not just the designers, are becoming *expert generalists* and more important, *communicators* (McLean, 2004; Hooper-Greenhill, 2006). There is the double redistribution of

authority in the interpretive process of the museum exhibition: (a) within the exhibition creators' circle, where various disciplinary experts share the authoritative role; and (b) beyond the exhibition creator's circle, where there is more inclusion of the audiences and their input. Many museum professionals advocate the idea of audience Involvement during the interpretive process as the key for museums to become more democratic by reinforcing pluralistic views.

Representational accuracy. An underlying challenge in the current exhibition trend of experience making is an issue of representational accuracy. In spite of the exhibition creators' good intention to promote and facilitate learning, the design components as well as new media and technologies could compromise the accuracy of the presented historical data with sensory and emotional overtones. The issue lies within the twofold uncertainty of museal representation via exhibition design: (a) the represented culture/history being a construct based on the exhibition creators' interpretation–appropriation, and (b) the exhibition creators' construct being subsequently subjected to and materialized by non-neutral media. The potential communication slippage becomes inevitable, in which there is no such thing as direct, unmediated correlations between representations and meanings.

Conclusion

One of many pressing questions concerning the trend towards technology integration is, "Even if the equipment, processes, and costumes are thoroughly researched, is the demonstrated craft over romanticized?" (Alexander & Alexander, 2008, p. 263). This can be difficult to answer considering that the knowledge about audiences' learning experiences in museums remains elusive. Despite an increase in evidence of learning in museums, the paucity of understanding is partly due to the short duration and infrequency of individuals' visits (Alexander & Alexander, 2008; Hein, 1998). The design challenge for museums then becomes the ability "to determine what meanings visitors make from their experiences, and then to shape the experience to the extent possible [through] the manipulation of the environment" (Alexander & Alexander, 2008, pp. 276-7). The researcher is aware of the importance of involving the audiences in the investigation. However, as previously discussed the audience response is outside the scope of this study, the researcher thus focuses on the museum exhibition and design aspects. The prospect of future research in investigating the audiences is discussed more thoroughly in the Conclusion chapter).

The Canadian War Museum

This chapter examines the CWM (part of the Canadian Museum of Civilization Corporation) and its permanent exhibition as a whole, particularly concerning factual information, the mandate, the narrative structure, the main narrative, and the design approach of the CWM.

Factual Information

The new CWM's permanent exhibition, opened to the public in May 2005, is described here to provide context. The new museum building at Vimy Place was designed by renowned Canadian architect Raymond Moriyama. The full account of developing and building the museum can be found in the book, *In Search for A Soul: Building the Canadian War Museum (2006)*.

The indoor permanent exhibition consists of six galleries designed in a partnership between two exhibition design firms: Origin Studios (Ottawa) and Haley Sharpe Design (Leicester, UK). The portion of the permanent exhibition under the investigation of this research comprises four zones (Zone 1 to 4) known as the *Canadian Experience Galleries*, which constitute the main narrative-oriented part of the CWM exhibits. Each of the four zones contains a main theme dedicated to a particular war history period. These include: *Battleground* (pre-World War I), *For Crown and Country* (World War I), *Forged in Fire* (World War II), and *A Violent Peace* (post-World War II).

These four themed zones make up 4,923 square metres in total (see Table 1 below for an exhibition-space allocation). The approximate breakdown areas of the permanent exhibition's individual zones are: Zone 1–309 sq. m., Zone 2–1,061 sq. m., Zone 3–1,056.5 sq. m., and Zone 4–1,192 sq. m.

Table 1

Allocation of the CWM's Exhibition Space

Space names	Area (m^2)
McCrae Gallery	710.99
LeBreton Hall	3440.38
Regeneration Hall	244.91
Memorial Hall	79.76
Permanent exhibition	4923.49

Note. Adapted from personal communication with S. Dobbin, March 22, 2010

Throughout the exhibition space in all four zones, there are approximately: 1,570 artifacts, 2,000 graphic images, 200 display cases, 122 AV/NM units, and 50,000 square feet of graphic printing (S. Dobbin, personal communication, March 29, 2010). In exploring the entire permanent exhibition, a visitor would travel a distance of two kilometers (CWM, 2009b). From these figures, one can easily imagine the sheer scale of the CWM's permanent exhibition.

Mandate and Objective

As Canada's national museum of military history, the CWM's goal is "to ensure that the memory and meaning of Canada's military past will not be forgotten" (CWM, 2009a, p. 1). The Museum's mandate is therefore to educate, preserve, and remember.

> The Museum preserves the artifacts of Canadian Military experience, interprets them for present and future generations, and advances the professional study of Canadian military history, including the effects of war and conflict on the nation and all its citizens. (CWM, 2007, para. 1)

The single overriding objective of the Museum's exhibitions and public programs is "to help all Canadians understand their country's military history in its personal, national, and international dimensions" (CWM, 2007, para. 1). To fulfill the Museum's goals with the use of narratives, "each gallery highlights defining moments in Canada's military history and the ways in which past events have shaped the nation" (CWM, 2007, para. 5). The delivery technique of storytelling not only engages wider audiences on a personal level but also allows the Museum to focus on the human experience of war in various forms, including personal stories, artifacts, and recollections of ordinary Canadians. The design of the permanent exhibition galleries ultimately shows "how, through war, conflict, and peace-support operations, Canadians have affected and been affected by the world around them" (CWM, 2007, para. 4).

Narrative Structure

In serving as a military history museum and in presenting a Canadian experience through its military history, the Museum opted for the use of narratives as its main communication strategy (G. Ogden, personal communication, June 9, 2010). According to Glenn Ogden, acting manager of programs and interpretations and senior interpretive planner at the CWM, it would be impossible to communicate the intended messages with just material culture. The cohesive nature of narrative really enables the Museum to tell a full story by providing the thread of history

throughout the exhibition. The narrative further helps address the paucity of the collection to support some of the most important aspects of the CWM's story line, specifically, the pre 20th century material.

The narrative structure is based on the chronological order of historical events. Despite the linear quality of the chronology, the Museum also structured each individual exhibit within the permanent exhibition to be independent. G. Ogden (personal communication, June 9, 2010) explains:

> Within each gallery itself the understanding was that, whilst if you visit each one in turn, you would see an unfolding narrative throughout the permanent gallery of that very large story line. But you could visit each one of them independently and still get a major part of the experience without particularly missing out on anything other than the content in the other galleries.

So there was an attempt by the Museum to allow more flexibility in visitors' experiences and thus interpretation.

As for the communication approach, the Museum took a historical approach while involving the target audiences as well as other stakeholders during the front-end evaluation. More precisely, the communication techniques used to tell the story are consistent throughout the permanent exhibition with some minor differences from gallery to gallery (G. Ogden, personal communication, June 9, 2010):

> Within each gallery, there was certainly an attempt to take the visitors through a chronological experience. [It was] important... to be able to establish context, explore content, and present [an] evolving narrative that used [a] chronology base as we went through.

There is also naturally a selection process that occurred for each story line as not every year, not every event, conflict or person is mentioned.

Front-end Evaluation

In 2003, during the process of reinventing itself (both moving to a new location and planning a new exhibition scheme), the CWM contracted Decima Research Inc. to conduct a focus group study to support the design and development of its permanent exhibition. This was important to the Museum, as it had chosen a different presentation approach from other military history museums for its new facilities. The Museum's new approach aimed to:

> .. Enlighten the visitor with a fresh view of Canada's past and to recount Canada's military past through the eyes of those who lived it. More specifically, the human experience will represent the primary story channel rather than exclusively through the presentation of technology or strategy of war. (Decima Research, 2003, p. 2)

The focus group research targeted four types of visitors that had been underrepresented among the Museum's attendees at the time of development: women, youth, Francophones, and new Canadians (Decima Research, 2003). This qualitative research, although exploratory in nature and therefore not intended to present projectable measures, provided insights and directions that guided the development of the exhibition design.

The study shows that most participants found the old CWM experiences generally to be "boring, cramped, dark, hot, and mostly hands off" (Decima Research, 2003, p. 6). Decima Research also found that the exhibitions were simply *not interactive* or *tactile*, which prevented the visitors from getting "a sense of what war is really like." In response, the new CWM's permanent exhibition attends to many needs and suggestions offered by the focus group participants. Some of the suggestions include: more dioramas, more auditory and tactile elements, recreated scenes or simulated experiences, games, and so on (p. 7).

To obtain feedback on the content style (graphic images), participants were also shown a series of images as examples of what could be shown in the permanent exhibition. Female participants preferred images that showed more than one side of war, while "None of the participants considered the images to be too graphic.... Participants particularly students, tended to prefer photographs [to] drawings or sketches" (Decima Research, 2003, p. 16). As part of the study, participants were also asked to do free association when presented with four different events: the Battle of the Plains of Abraham, the First World War, the Second World War, and the Cold War. These four events later became the basis for how the main story line was divided up and were assigned as each gallery's key messages.

The Main Narrative

The main narrative of the CWM is about how wars have shaped Canada from the Canadian military perspective. The story line is then broken down into "major story elements going from earliest times up until today, chunked by various zones throughout" the permanent exhibition (G. Ogden, personal communications, June 9, 2010).

The first gallery–*Battleground*–recounts the wars of First Peoples, the French, and the British; it introduces the concept of war and how it relates to Canada and its people. The main theme of this gallery is *Wars on Our Soil from earliest times to 1885*, which enables the audiences to "explore the Canadian experience of conflict from aboriginal warfare and post European-contact Canada, to Louis Riel and the Northwest Resistance of 1885" (CWM, 2008). The second gallery–*For Crown and Country*–focuses on the South African and First World Wars between 1885 and 1931. It narrates "Canada's contributions in these overseas wars [which] led to a growing autonomy and international recognition, but at great cost" (CWM, 2008). Visitors are invited to experience:

> ...An imperialistic setting marking the 1897 Diamond Jubilee. Canada was proud to be part of the British Empire and celebrated in its greatness. Despite intense debates over whether to support Britain's war in South Africa, Canada sent an overseas force. This decision marked an important change in Canadian military relations: Canada was now willing and able to support its allies by fighting in other countries. (CWM, 2008)

The third gallery–*Forged in Fire*–retells the accounts of the Second World War, 1931-1945. It details "Canada's fight against dictatorships overseas [and how it] transformed the country and its place in the world," while the audiences are introduced to "the oppressive and aggressive dictatorships of the 1930s, and the mounting pressure for a strong response from the rest of the world" (CWM, 2008). The last gallery–*A Violent Peace*–is about the Cold War, Peacekeeping, and Recent Conflicts from 1945 to the present. The theme shows how Canada as a nation became "a respected international player through its commitments to Western defence and peacekeeping" (CWM, 2008). Within this gallery the audiences are also intended to learn about the post World War II era during which Canada prospered and was largely at peace, except for "the Soviet nuclear threat and the onset of the Cold War" (CWM, 2008).

Design Approach

According to Bill Haley (2005) of Haley Sharpe Design, designing the CWM's permanent exhibition was "a thrilling yet complex challenge;" the design approach taken by the museum staff was to develop a story line–"a framework defining the context, content and consequences of Canada's military history" (p. 1). The narrative serves as a guiding principle to the design and development of the permanent exhibition. More important, it is a key element that can be seen throughout the exhibition in various forms: physical spaces, displays, and other features. The

design team, in close collaboration with the curatorial staff, was to "interpret the established story line, complement the dramatic new architecture, and develop strategies to convey the varied moods and messages" intended for visitors (Haley, 2005, p 1) Haley explains the design challenges and goals

> In addition to producing a rich, multisensory, mixed-media visitor experience, Haley Sharpe and Origin Studios developed a message-driven art/graphic strategy that both communicates and manages multiple and often dense levels of information The design needed to achieve a balance between historical facts, hard data and the intensely personal, emotional, heroic and sometimes disturbing human aspects of military history (pp 1-2)

Haley discusses four key components of the CWM's design development These are the themes, the pace and timing, the imagery, and the dynamic The four major themes that encompass the interpretive story lines are Geography, Politics, Brutality, and Survival Each of these themes, created by the Museum's historians, has been integrated into and reflected in "the fundamental aims and objectives of the permanent galleries" (p. 2) Concerning the pace and timing, the designers carefully devised the effect and pacing of the exhibition contents, including visual imagery, artifacts, and spaces, in close reference to their chronological and historic contexts In addition to the time and consideration given to how to present and pace the story line, the designers also organized the informational contents into 'a flowing, organic, and instinctive hierarchy of messages to avoid overwhelming, confusing or numbing the visitor" (p 2) With the Museum's vast collection of visual materials (although not in all periods), the design team carefully selected images to communicate the themes and their messages Out of more than 2,000 images, nearly 500 were enlarged to an enormous scale to be the background and/or the feature of a wall panel "The team needed to consider not just what they would look like when displayed at floor-to-ceiling height, but also what messages they might convey on such an imposing, and even threatening, scale" (p 3) The images, as key design statements, were also complemented by "individualized colour palettes for each cluster of graphic panels" to enhance the messages without words (p 4) To reflect and depict the dynamic nature of history and military conflict, the permanent exhibition incorporated film materials, photographs, and artifacts to convey a sense of movement and dynamism Haley notes that the design team above all wanted to create "an intense, emotional, memorable, and honest presentation of the moments which have helped define Canada's national identity" (p 4) This was achieved through manipulating a diverse range of media along with "an equally broad range of messages" (p 4)

In researching the formation of the permanent exhibition in terms of its premise, objective, narrative, messages, and design approach, two things become evident. One is that within the chronological (linear) structure of the Museum's main narrative, there is an attempt to enable flexibility in visitors' experience by creating stand-alone subtheme exhibits within the exhibition. The other is that the design team seemed to stress sensory and emotional appeal during the development. Sensory and emotional appeal is one of the main concerns of this thesis in relation to the influence of design elements. To specifically examine the impact of design and technological components on the permanent exhibition's communication of its messages, the following chapter explains the selected investigative methods.

Research Methods

This chapter details the three methods used in this research to investigate how and to what extent the use of design elements, in the form of new media and technologies, influences the conveyance of the exhibition's messages. The three investigative methods are: semi-structured interviews, audiovisual/new media (AV/NM) database analysis, and descriptive visual analysis of selected AV/NM units.

Semi-structured Interviews

To get an idea of the narrative-oriented exhibition type as well as the CWM as a museum and organization; semi-structured interviews are used as the first step in the overall data collection (see Appendix A for interview questions). More precisely, the investigative interview method is employed to gain insights into the narrative exhibition development procedure and decision making from key players' experiences. The findings from the interviews are also used to tailor more specific later steps in the analysis.

The semi-structured interview approach was selected for a number of reasons. These interviews are somewhat flexible and enable the exploration of ideas and lines of thought, which may not be planned by the researcher. Thus a more in-depth and broader range of responses may be captured in this process. With its semi-structured nature, responses of interviewees can also be compared and quantified for a more rigourous statistical analysis.

The research intent was to recruit individuals who were directly involved in the development of the permanent exhibition or are currently working at the Museum and responsible for these galleries. The participant selection was thus based on the knowledge of, and familiarity with, the CWM permanent exhibition through work experience.

The total pool of potential participants is approximately 20. This is estimated from the number of people who were involved in the process plus those who are currently working at the CWM. The target number of interviews was six to eight This number of interviews from this pool of individuals was deemed sufficient to provide a range of qualitative insights for consideration and comparison.

The participant selection included curators, exhibition designers, and interpretive planners. In addition to playing key roles in creating the exhibition, the selected participants represented the three principal and distinct areas of expertise in museum exhibition. The attempt to triangulate data sources is intended to identify the frequency of certain perspectives and the uniqueness of others in order to give an accurate picture of the interdisciplinary process involved. This ultimately leads to an understanding of the influence design components have on the representation of culture/history and the communication of the exhibition's messages.

Interviews were approximately 60 minutes in duration and were audio recorded. Each participant retained the right to withdraw from participation at any point and to request that opinions and comments not be attributed to him or her. Interviews were conducted under the approval of Carleton University's Research Ethics Board. The transcribed data collected from the series of interviews were analyzed collectively in a semi-quantitative format (see Appendix B) in order to produce a findings summary.

The interviews consisted of three sections: personal background, opinions about the role of design and its influence in museum exhibitions, and future challenges and areas for improvement. The opinions about the role of design and its influences on museum exhibitions is the most extensive section. It was designed to probe for particular insights on the influence of design processes and elements on the conveyance of the exhibition's messages.

Face-to-face interviews are more conducive to semi-structured dialogue and all reasonable attempts were made to conduct them in this manner Although face-to-face interviews were preferred, participants were also given the option of telephone interviews or as a last resort, e-mail correspondence. Out of the seven participants, four interviews were conducted face to face, two over telephone, and one via e-mail correspondence

Audiovisual/New Media (AV/NM) Database Analysis

This method allows the researcher to assess the influence of design elements on the message communication of the CWM's permanent exhibition in a more quantitative and objective manner. The AV/NM database contains classification of media/presentation style as well as numbers and types of technical components used within the exhibition's four zones. This analysis aims to elucidate two aspects on two levels: on a macro level, to reveal the ubiquity and

location of AV/NM design elements throughout the entire permanent exhibition, on a micro level, to show the complexity of each AV/NM unit in terms of its technical components and of how it relates to the exhibition message communication.

On the macro level, the analysis specifically looks at the total number of technical components of each AV/NM unit. For the purposes of this research, which concerns design elements that affect the exhibition communication, the method only accounts for technical components that either stimulate visitors' sense(s) and/or involve direct audience interaction. The pertinent technical components used in the CWM's permanent exhibition that have sensory impact include different sizes and kinds of visual display, projectors, various kinds of audio outputs, buttons and keypads, AV cabinets, media system, DVDs, CDs, PCs, and touch screens (specific details are discussed in the Research Findings chapter). The total number of each unit's technical components is calculated and compared using Microsoft Excel.

To delineate the density of technology integration within the four galleries, the permanent exhibition's floor plans are marked up according to each unit's location per zone. Each unit's locator is made up of multiple rings. Each ring represents one technical component; the locator visually illustrates each unit's complexity in comparison to the others. For instance, a locator for a unit with three technical components will be a quarter of the size of a 12-component unit.

On the micro level, the method focuses on two aspects of each AV/NM unit: the classification of each unit's media/presentation style (entailing both main and subsidiary types) and the precise number and types of technical components that make up each unit. For example, a self-standing, touch-screen interactive unit is accounted for in the database as *interactive video* subtype under the main type of new media. It consists of three technical components: one touch screen, one PC unit, and one AV cabinet.

The findings from this investigative method are also used to determine the unit selection for, and used in conjunction with, the descriptive visual analysis. By performing both macro and micro levels of analysis on the AV/NM database, the resulting information allows insights into the extent to which design influences the exhibition's messages and thus dominates audiences' interpretation and experience.

Descriptive Visual Analysis of Selected AV/NM Units

The third research method specifically examines the relation between the use of design elements and the communication of the exhibition's messages It entails (a) examining the context and messages on site using specific observation criteria, and (b) comparing it to the information from the semi-structured interviews about curatorial intent from people who were involved in the process of constructing the narrative This is to investigate how the current setup, or choice of media, amplifies the narrative by determining the correlation between the complexity and type of media, and the complexity and importance of the messages

The permanent exhibition includes a great number of AV/NM units, each containing a variety of technical components Selection of appropriate AV/NM units for the descriptive visual analysis consists of two stages statistical analysis of the AV/NM database and nomination of specific units by the curatorial staff

The first stage of the selection process is largely based on the findings from the AV/NM database analysis It focuses on two key considerations media-type representation and range of technical components The first criterion is to ensure that the chosen units represent the predominant media types that exist within the permanent exhibition The second criterion takes into consideration the range of the technical components of all the units under each media type Units with the highest and lowest technical components are selected for the three most common subtypes, audio, AV, and interactive video For the other four subtypes (game, game with sounds, video and soundscape) only one unit is investigated as they are not as prevalent and the range in the number of technical components is not very large

In carrying out the first stage of selection, it often occurred that more than one unit from different zones might qualify for the selection The researcher of this thesis project then took into consideration the unit's theme to make sure that there is balance across all four zones It is important to note that the selection process also ruled out any combined units–indicated by the last hyphenated portion of the call number (after the zone/theme identification) For instance, a standard unit's call number is 2 D 1 6-AV2, however, a combined unit would have a call number like 3 E 3 3-AV1-2, meaning AV1 and AV2 This is to ensure that all units being considered are

individual units as it is impossible to assign an accurate, specific number of technical components to each individual part of the combined unit.

From the first stage of selection, a list of units for the descriptive visual analysis has been drawn up (see Appendix C). The selection list contains ten preferred units and nine alternative units to accommodate the second stage of selection. The curatorial staff's nomination involved having the selection list reviewed by Glenn Ogden (acting manager of programs and interpretations as well as historian). A second opinion was also obtained from interviewing June Creelman (interpretive planner during the front-end phase and throughout the development of Zone 2). Note that there is no other AV/NM unit with a high-enough number of technical components to serve as an alternative for the preferred unit of interactive video (high) subtype. In providing the alternative choice for each subtype to be investigated, it helps to ensure that both G. Ogden and J. Creelman would be able to provide input on the curatorial intent and communication strategy of each selected unit.

Having learned the curatorial intent, the researcher then conducted an on-site visual analysis for each of the selected units. The four observational criteria are: context, media used, visual graphics, and written content. Written notes and photographs were taken to help write the descriptive portion of the visual analysis.

Research Findings

The previous chapter delineated the three main investigative methods used to examine how the use of design elements affects the communication of the intended messages in narrative-oriented exhibitions This chapter reports in detail the findings from the investigations It consists of three main sections a summary of the semi-structured interviews, an analysis of the AV/NM database, and descriptive visual analysis

Summary of Semi-structured Interviews

The following findings are from interview accounts of seven participants three with design backgrounds, two with interpretive planning backgrounds, and two with curatorial/museum studies backgrounds All participants have previous and/or current professional experience in museum exhibitions Five of the seven participants were directly involved in the development process of the CWM's permanent exhibition as exhibition designers, historian, project managers, and interpretive planners Two of the seven participants were not involved in the development process However, one is currently working for the CWM as exhibition manager, while the other has had over 30 years of experience in interpretive planning for museum exhibitions The interview summary is divided into three subsections personal background, the role of design in museum exhibitions, and future challenges and areas of improvement The findings are reported in the order the interview questions were asked to maintain consistency with the detailed accounts in Appendix B For a brief interview-response summary please see Appendix F

Personal perspective on exhibition development. Findings concerning each participant's background demonstrate that they share many common ideas and interests As to the initial attraction to working in museum exhibitions, they all express their passion for learning and acquiring new knowledge All participants who do not have design background also mention a desire to apply and disseminate their knowledge in a practical way Certain aspects of museum exhibitions that many participants enjoy the most include collaborative process and working environment, problem solving and creative thinking, and the challenge of creating an exhibition as a means of communication Upon considering these findings, it is axiomatic that an innate drive in knowledge dissemination and learning among team members is critical to the success of the interdisciplinary collaboration of exhibition development

Table 2

Participants' Backgrounds

Participants	Contribution[1]	Current position	Previous experiences	Educational background
Marc Beck	Exhibition designer at Origin Studios (OS)	Senior project manager at the Canadian Museum of Nature (CMN)	Senior exhibition designer at the CMN; practice in the US since 1994	Bachelor of Industrial Design (1993), Carleton University
Daniel Boivin	Exhibition designer/ partner at OS	Senior exhibition designer at the CMN	Partner at OS; worked on exhibits for the National Archives and the Canadian Museum of Civilization	Bachelor of Industrial Design (1995), Carleton University
Lorraine Brown	No contribution	Interpretive planner at Apropos Planning[2]	Ontario Science Centre, interpretive planning consultant since 1972	Undergraduate degree in Biology; Master's in Environmental Studies, York University
June Creelman	Interpretive planner (for Zone 1 and 2)	Director of exhibition and interpretation at the Portrait Gallery of Canada	Interpretive planning consultant for 20 years at Apropos	BA in History; MA in Canadian Studies
Sarah Dobbin	No contribution	Exhibition manager at the CWM	Contract with the CMN; exhibition and tradeshow design; history in theatre.	Bachelor of Industrial Design (1997), Carleton University
Patricia Grimshaw	Project manager (in charge of graphics)	Consultant	Assistant Historian, other exhibits (Robarts Library)	BA (Hons), Queen's University; MA in War Studies, Royal Military College of Canada, Master of Museum Studies, University of Toronto
Glenn Ogden	Historian	Acting manager of programs and interpretations; Senior interpretive planner at the CWM	Started in 1998 in the UK; training through a museum program in Canada towards a museum exhibition design; various contract positions.	MA in Modern history, Oxford University; postgraduate qualification in Museum Management and Curatorship

Note 1. Contribution to the development of the CWM's permanent exhibition , 2 Canadian firm specialized in museum research and development

Regarding the interdisciplinary aspect of museum exhibitions, all seven participants agree that the people they collaborate with vary between projects and also depend on the organization or the museum. However, the three principal and consistent collaborators crucial to a museum exhibition development process are the curatorial staff (an historian in the case of the CWM), the interpretive planner, and the exhibition designers (both 2D and 3D). Concerning the interdisciplinary work involved, most participants value the sharing of knowledge and perspectives as being the most rewarding. L. Brown (personal communications, February 16, 2010) comments "All together we [the exhibition team members] build up something that is way better than what anyone of us could have done on our own." S. Dobbin (personal communications, February 18, 2010) states "It's important to know that with exhibition, it's not just about one person.... [There are] a hundred other people that also touch the exhibition development in some way or another, right from interpretive planning to installation of electrical, fabrication". It is clear that each participant acknowledges the necessary team effort, common objectives, and coauthorship/ ownership in creating an exhibition.

With regards to the challenges within the interdisciplinary work process, many participants mention communication while several indicate each individual's availability (schedule conflict). The majority of the participants note each team member's disciplinary disposition, entailing both priorities and work process, as the main challenge of interdisciplinarity. D. Boivin (personal communications, February 11, 2010) discusses the issue and further elaborates on the potential role of the designer and interpretive planner:

> Everybody brings their own baggage and their own professional deformation [sic] to the process.... But if the designer has the right attitude, he or she can be the advocate of the visitor... and so can put him or herself in a shoe of the visitor. [He or she can] perceive how the impact or the outcome of any decisions might actually be... whether it's beneficial to visitors, useful or effective or not. The interpretive planner and/or content developer also acts as an advocate for the visitor.... They often bridge the basic visitors' needs with the need to transfer information over to the visitors.

The interview questions also sought to learn about each participant's view on the exhibition trend towards experience making, particularly concerning its advantages and disadvantages. This trend focuses on creating sensory-stimulating experiences, entertaining qualities, and technology integration within the designed narrative environment. D. Boivin, however, offers the reasons behind such a trend. First, museums are currently competing for the general public's leisure time. The trend is thus an attempt to help them learn in entertaining

ways The purpose of informal learning environments and museum exhibitions are means to that end Second, considering the ubiquity of technology around us, there is also a rising expectation from the audiences that the exhibitions are done intelligently This leads to audiences' needs and desires being taken more into account during the development process in new exhibitions These reasons are in line with suggestions from the literature review, while also indicating a need for future research on the audience interpretation

Many participants consider the trend's main advantage to be in accommodating various learning styles However, more than half of the participants assert that technology integration is not an end goal and that regardless of design techniques and approaches, an environment needs ultimately to be conducive to learning "Technology is only at the service of the story and if it's the right thing to do then we'll do it, otherwise we'll go with low tech or no tech" (D Boivin, personal communications, February 11, 2010) G Ogden (personal communications, February 18, 2010) asserts that the use of multimedia, multisensory, physical design elements is just one approach With modern museology and practices, there are a variety of approaches and styles, the key is to look at the target audiences and their preferences and learning styles S Dobbin (personal communications, February 18, 2010) further emphasizes the importance of technology in meeting the needs of intergenerational audiences, so that both younger and older visitors can use the technology without any difficulty These findings demonstrate how the rationale behind the use of new media and technologies largely depends on what is the best vehicle to impart specific knowledge to the target audiences

There are several disadvantages to the trend towards technology integration P Grimshaw (personal communications, February 25, 2010) cautions the possibility of an overbearing and misguiding effect of design on the exhibition's messages and focus G Ogden (personal communications, February 18, 2010) elaborates that in relying on, and heavily integrating, new media and technologies museums risk losing the purpose of their messages, the uniqueness of their collections or other elements, as well as the purity and the focus of their exhibition This is all because exhibitions with high technology integration can easily confuse the audiences between what is real and what is imaginary It is thus crucial that designers, as one of the three key players in developing an exhibition along with curators/historians and interpretive planners, are aware of the consequences of their design choices

The role of design in museum exhibitions. The second section of interview questions investigates aspects of museum exhibition in relation to design These include the purpose of design, benefits and weaknesses of different design elements, key considerations, potential influence on the audiences and misrepresentation, current assessment and authority of the exhibition's communication, as well as the exhibition's success due to design

The purpose of design. Each participant was asked to identify the purpose(s) that design serves The general notion of design among the participants turns out to be the materialization of the interpretation (narrative) in an exhibition form G Ogden (personal communications, February 18, 2010) specifies that design serves "to translate the interpretive scenario of an exhibition with all the various detail components, messaging structure, use of content, as well as aspiration in terms of directed mood, feel, look, and interactivity in the space, [and to] move it into a concrete world "

After the participants shared their ideas about the role of design, they were told the three main purposes of design that have been identified in this research so far to convey the exhibition's messages, to engage the audiences, and to represent the subject matter All participants are in accord with the three identified purposes L Brown (personal communications, February 16, 2010), however, contests the use of the term *represent*, as she sees the design of an exhibition more as to amplify, enhance, elucidate, or even present the subject matter

Each participant was then asked to think of other purposes for design and rank the three given More than half of the participants prioritize the importance of conveying the exhibition's messages More than one participant explicitly emphasize the notion of design playing a supporting role–serving to amplify and enhance the exhibition's messages Other design functions mentioned are ensuring consistency among exhibition contents from the technical/ logistical perspective, and challenging the assumptions of other team members in terms of generating creative solutions to the exhibition's messages and interpretation G Ogden (personal communications, February 18, 2010) explains

> What's important in a full collaboration is [for designers] to look at the scenarios we created, which quite often has design elements in there, or may identify design challenges, and solve those problems with us [curators/historians] and lead the challenges that we have [What] is very valuable and highly priced is having a designer who's able to meet with us on equal terms and inform what we've been doing and evolve our experience and our ideas for presentation to take it to another level really

Considering these findings, it is possible to say that design mainly serves to facilitate and enhance the communication process between the exhibition and its audiences However, the design purpose, and thus the role of designer, can vary depending on the type and intent of the exhibition

Benefits and weaknesses of different design elements. Each participant was then requested to state a purpose(s) for *design elements* used in museum exhibitions The three main categories identified thus far are physical interactivity, visual graphics, and multimedia applications (sound, video, and projection) Most participants agree on the primary purpose of physical interactivity, which is to accommodate different learning styles Many participants also specify its use to engage the audiences physically, which helps promote visitors' personal interest, social interactions during the visit, and the visit duration More than one participant mention that the use of physical interactivity helps to communicate certain ideas by making audiences' experience of the exhibition memorable and readily comprehensible, through techniques of simulation G Ogden (personal communications, February 18, 2010) elaborates on the use of physical interactivity for the CWM

> The physical interactives [sic] are very popular but they're not always easily defined as to what they are They certainly serve couple of valuable roles I think if [visitors are] able to interact with something and engage themselves physically with it and also mentally, it's a way of reinforcing the message It's a way of also giving them a different type of experience rather than just consuming visually what they've seen in front of them and feeling what they do as they go through an exhibition So it's a good way of creating a varied experience in the space, but it depends on what the type of interactive it is One of the challenges is [that] there are limitations as well This is where I think in most case for [the CWM], the role of design is absolutely critical in ensuring that we can produce successful interactives [sic] and in the meantime messages and so on

As for the functions of visual graphics (particularly imagery) in museum exhibitions, the top three purposes are (a) to communicate and/or support the messages, (b) to immerse the audiences in the content and context through tone and mood setting, and (c) to draw audiences' attention by giving the first impression These can mostly be achieved through manipulating image size, colour, contrast, and such elements Several participants also note that the visual graphics could also be the featured subject Aside from being more appealing to visual learners, both G Ogden and L Brown regard visual graphics as powerful communication media or mediators in museum exhibitions, as they immediately elicit emotional (visceral) responses from the audiences G Ogden (personal communications, February 18, 2010) expands on the use and value of visual graphics to the CWM in particular

> Visual graphics are very important communication medium for [the CWM] A well-selected graphic in [Canada's] bilingual environment communicates without language There are visual cues that people can pick up immediately by looking at an image, whether it's emotional responses [or] factual responses to the scale of spectacle I usually find [visual graphics] as [key anchor elements] in [many] exhibitions that I've worked on They really serve [the] intention to draw visitors into a situation, to communicate very quickly an important message, [and] to provide for content exploration [Their purpose also depends] on the hierarchy and where the images are used

As for the use of multimedia applications, most participants consider their use for stimulating other senses in communicating the messages through created experiences All except one participant also value multimedia applications in supporting the interpretation and narrative as they can allow for more information to be presented in an engaging and intuitive fashion, such as through video, audio, projection, and computer interactivity This can be achieved, for instance, by creating audible distinctions between themed areas D Boivin (personal communications, February 11, 2010) attributes the essence of multimedia applications in an exhibition to their likelihood to increase audiences' information retention G Ogden (personal communications, February 18, 2010) further details their use in the CWM

> [Multimedia applications] do a couple of things for [the CWM] They certainly give more exposure to content, which allows [the CWM] to interpret history in a different way [Moving images are] more evocative than still [images in communicating in most cases] They're also very useful for creating mood and setting a tone in the space [The CWM] also [classifies] multimedia applications [as] in-gallery, new media stations that help [to] interpret a model or a larger artifact, where [visitors will] be able to use a touch screen, go in and find out more information, and manipulate virtually an artifact as well
>
> The challenge always is Is the message being delivered? Are we doing it for the right reasons? Or is our audience going to be able to use and interact with this package that we put together? Does it meet their needs? Can we afford to do it? And [do we] have sufficient time to develop these products to the quality or the level that we'd like

As to whether any of the three approaches (physical interactivity, visual graphics, and multimedia applications) are more effective than the others in conveying the exhibition's messages, all seven participants agree that this depends on the exhibition's messages and objectives, the audiences, as well as the kind and the amount of information G Ogden (personal communications, February 18, 2010) recounts several key points about the use of design elements for the CWM (a) visual graphics and multimedia applications, same as video projections, have been the more successful design elements, they are the techniques that the Museum is accustomed to employing in exhibitions, (b) the particular challenge of using physical interactivity is "marrying the intent of the interactive with the actual final execution of it," and (c) the CWM, as message-driven institution, prioritizes the scholarly robustness of the historical

content over design elements. D. Boivin (personal communications, February 11, 2010) details a general rule of thumb for choosing a design element and ensuring its effectiveness in message delivery:

> To impart [a fairly difficult topic]... requires a fairly structured or linear sequencing of messages to get the point across, then an audio/visual presentation... might be the best way to do that.... To impart an open-ended topic or a question that deserves an exploration, then a physical interactive might be the best way to do that. Visual graphics... inherently do not offer interaction other than reaction or impression. [Although ubiquitous] their role is [more] secondary [compared] to what those other two can do. [It also] depends on the kind and the amount of information.... [For example,] a mineral smaller than an egg [but with] ten pages long [content]... deserves something... more in the realm of multimedia, where we're looking at layering the information, sequencing it in a way that can ease the visitor into the topic.

As to disadvantages with the use of design elements, many participants raise the issue of unintended outcomes causing confusion or conflicting messages for the audiences. Several reasons identified by the participants are. (a) an overwhelming presence of design elements pulling audiences' attention away from the message, (b) a misuse of the design elements by the audiences, and (c) a cross-purpose communication due to the integration of numerous design elements. M. Beck (personal communications, February 9, 2010) emphasizes that "Unless it is tested properly, there's a chance of it backfiring and you're not getting the information across the way you wanted to." P. Grimshaw (personal communications, February 25, 2010) also remarks, "Sometimes design can overpower an exhibition, leaving the visitors wondering exactly what they're here to see: a museum exhibit or a study on design. The design should be invisible, enhancing, but not overwhelming the exhibition." Several participants point out that the main disadvantages of using design elements have to do with costs and resources required in the production and quality control processes. For instance, visual graphics tend to be more cost effective in comparison to physical interactive and multimedia applications in an exhibition. Both G. Ogden and S. Dobbin identify an issue of copyright when using and/or creating audio and visual material from other sources.

Upon considering the participants' comments about each design element category, it becomes obvious that each approach or medium has its own benefits; the choice largely depends on the exhibition's objectives and messages, the target audiences, the kind and the amount of information, as well as the museum's available resources.

Key considerations. When participants were asked to identify some key design considerations in the exhibition development process, the top two responses were communication and accessibility As for the exhibition's communication, the crucial considerations include (a) making appropriate design choices that enhance the exhibition's message, (b) ensuring the content's simplicity and clarity, and (c) maintaining the immersive and potentially entertaining qualities of the exhibition G Ogden (personal communications, February 18, 2010) stresses that communicating the exhibition's messages takes priority over aesthetic, "Spectacle has its place in an exhibition for sure, and design gets us there But really [the basics of communication] need to be there [first] " More than one participant also note an issue of communication effectiveness within the design team to make sure that the team understands the goals and nature of the product–the intended exhibition–throughout the process Concerning accessibility, G Ogden identifies the two fundamental aspects in museum exhibitions paramount to the success of exhibition experience accessibility to the messages and usability of the space S Dobbin, as the current exhibition manager at the CWM, specifies several considerations of physical and informational accessibility contrast, size, legibility, and hierarchy of textual content, viewing distance and comfort, space flow and traffic, and the appropriateness and the amount of information Language accessibility is also part of the Museum's mandate as a federal institution

In analyzing the participants' responses, there are two areas of potential limitations due to design characteristics of the space and exhibition content Most participants believe that design can physically limit audiences' ability to comfortably experience the exhibition and access the information presented, due to the height, scale, legibility, and location of certain elements within an exhibition More than half of the participants suggest that the design limitation on the exhibition content has to do with the amount and the organization (grouping and order) of information that is being presented to the audiences In addition, the aesthetic quality of design can also interfere with communication D Boivin (personal communications, February 11, 2010) explains

> Less is more The design or the characteristics of a space need to serve the story, the purpose of conveying mood and message It's a communication medium If it's speaking in its own terms, it's not doing its job It's meant to be a canvas, on which stories are being painted And if the canvas or the frame is too ornate, it competes with the story So it has to be readily understandable in most contexts, simple and straightforward not overly laden with details or design

Upon considering these findings, it is plausible to say that the key issue of accessibility needs to be taken into account on two levels, physical and informational

Potential influence on the audiences and misrepresentation. All participants firmly believe that design elements do influence audiences' interpretations More than half of the participants assert that the influence of design elements depends on the exhibition's purpose, and more important, the audiences This is because each receiver's response and interpretation is hardly predictable or controllable, as each comes with his/her own preconceptions Many suggest that design elements give signals in the exhibition setting that support and/or amplify the messages J Creelman (personal communications, March 5, 2010) explains, "Juxtaposition of items can create unintended meaning For instance, backdrop images [as] size can also imply value for something that may not necessarily have such value " More than half of the participants mention that the design elements elicit emotional response(s) and interest from the audiences G Ogden (personal communications, February 18, 2010) points out the implication of design influence in museum exhibitions That visitors absorb any of the content or gain an understanding of any messages at all points to the design's contribution to the communication of the intended messages The space within which the visitors experience the exhibition is a three-dimensional, deliberately designed environment Design is a delivery mechanism that is part of the entire product In addition, museum professionals also know from learning style theories as well as practice, that certain kind of design techniques can be more effective than others

On the negative side of design's influence, all except one participant strongly accept the potential misrepresentation of the subject matters and messages L Brown (personal communications, February 16, 2010) admits that it could happen, but she also notes that the way the development process works, involving various teams and approval procedures, helps prevent any misrepresentations More than one participant also assert the importance of a team approach and approval process Several participants mention that misrepresentation could be attributed to the unintended and unpredictable interpretation and response of the audiences J Creelman (personal communications, March 5, 2010) elaborates

> If the designer doesn't understand the value or the intent, it can misrepresent the meaning [Design] is very powerful and a lot of people don't read so they just glance and make meanings based on the design Team approach is there to ensure the message accuracy, it's not a straight-line process

Other potential causes of misrepresentation in museum exhibitions are (a) a natural decay from conception (curatorial intent) to materialization (actual design), (b) the inherently subjective nature of interpretation, (c) losing sight of original intent during a long review process and a series of design iterations, and (d) failure of the developmental process in terms of communication among the interdisciplinary team members D Boivin (personal communications, February 11, 2010) offers a suggestion to avoid any misrepresentations by keeping in mind of the objectives when designing to avoid overly expressing a particular theme or misinterpreting a theme It is obvious from the interviews that design does influence the conveyance of the exhibition's content and messages, and therefore affect audiences' interpretations However, it is difficult to articulate and ascertain how, as each individual's disposition and reaction are private and each exhibition is case specific.

Current assessment and authority of the exhibition's communication. As to how museums currently assess their exhibitions, most participants agree that in theory there are various assessments that museums can perform as front-end, formative, and summative evaluations These assessment methods include questionnaires and focus groups for front-end evaluation, design-specific evaluations of such aspects as prototyping and internal testing (using staff and team members in place of the actual audiences) during the formative stage to ensure communication effectiveness, and tracking studies and exit surveys for summative evaluation to assess the success of the exhibition However, more than half of the participants claim that when, and if these evaluations are performed depends solely on time, resources (budget and personnel) as well as the institution G Ogden and S. Dobbin both confirm that the CWM does have a formal review procedure for their exhibitions and again it depends on the scale and the importance of the exhibition

Considering design as an essential vehicle for delivering the exhibition's messages, the interviews also probed for the authority involved in what and how museums communicate Several participants claim that it depends on the museum and, more specifically, on each exhibition and its objective Many participants explain that in general or on a higher level the museum, in the form of an executive committee, has the ultimate authority on what gets to be communicated The decision is made through an exhibition director channeling through various stringent approval processes On the exhibition development level, in particular, most participants

state that the curatorial staff or the interpretive planner holds the authority. Both J. Creelman and D. Boivin claim that the authority for what and how museums communicate usually rests upon the person who has written the text.

Given the demand for democracy and voice in interpretation, many new museological theories advocate the idea of involving the intended audiences in the design process. The interviews hence also probed for audiences' involvement from the participants' experience. Several participants indicate that it depends on the budget and time. Many mention audiences' involvement during the front-end and/or summative stage, which is often in the form of focus groups and/or surveys. From the curatorial and interpretive planning point of view, audiences' input is to ensure that the exhibition's messages resonate with the public opinion, which is especially important when dealing with a difficult or sensitive subject matter as noted by G. Ogden. As for designers, both D. Boivin and M. Beck value audiences' input as it can help them to make certain design decisions. From the interview responses, it shows that each exhibition is unique and that the museum's assessment and authority of its communication by and large depend on the organization's resources and the exhibition's scale.

The exhibition's success due to design. To sum up the influence of design elements on an exhibition, each participant was asked about his/her opinions on an exhibition's success due to design. Many participants firmly assert that design is critical to the exhibition success. This interdependence between curatorial/interpretive content and design elements in exhibition communication is consistent in all seven participants' responses. Two participants, G. Ogden and M. Beck, discuss the role of design in terms of a triad between curator, interpretive planner, and designer. G. Ogden (personal communications, February 18, 2010) explains the notion of the triadic process:

> Design is the third leg of the three-legged stool in terms of creating 3D visitor's experience in an exhibition. The other two legs... are historical content and interpretation. So design is really an equal partner in delivering that experience. It is [crucial] in being able to transmit our objectives and our content to the wider public... [and in] approaching our visitors. .. So it's an integral partner in delivering what we do here at the Museum or any museum

As mentioned by the participants in various ways, because of the complexity and demanding scale of creating a museum exhibition the contribution of design extends well beyond the stereotypical realm of aesthetics of an exhibition; it entails physical comfort, content,

messages, and ultimately audiences' experience. G. Ogden (personal communications, February 18, 2010) captures the value of design elements:

> With a strongly messaged, well-curated exhibition and a well-designed experience, [design] contributes everything.... Is a wonderful ecstatic experience always critical to the effectiveness of exhibition? No. Because you can have a relatively mediocre design process but as long as it's accessible and usable and performs certain functions, it works. Besides the differences between BMW 7 and Hyundai Elantra, The Hyundai Elantra gets you from A to B, it can be fairly comfortable but it's not like being in a BMW, but it serves a purpose. That's what always important about design in this context.

Upon considering the participants' responses, design is integral in an exhibition development. However, it is only one out of many components that contribute the overall success.

Future challenges and areas of improvement. The last section of the interviews probed for challenges that museums face in creating exhibitions. These challenges mainly concern four areas: the museum as an institution, technology advancement, changing demographics, and exhibition design.

As for the museum as an institution, many participants express concern about funding. More than one participant note that museums are competing with other forms of entertainment, such as movies and shopping. Many participants emphasize that dwindling resources make it difficult to compete with the private sector, particularly with regards to technology integration and updating already-existing technologies within an exhibition. In dealing with technological advancement and integrating content, more than half of the participants specify the challenge of time and resource constraints. For instance, S. Dobbin (personal communications, February 18, 2010) points out that "The content to be used with technology often needs to be much richer than [the Museum has] the human resources to deal with. Copyright issues... can take time and money to find and to integrate." With the changes in demographics and information-consumption patterns, more than half of the participants indicate an awareness of the higher expectations placed upon museums for technology use in an exhibition, which can be a difficult target to meet given all the aforementioned constraints. As for the design aspects, D. Boivin (personal communications, February 11, 2010) claims that the designers' responsibilities would extend beyond their conventional roles requiring them to be conversant with other terms and professional languages as a result of exhibition development becoming an increasingly interdisciplinary process.

As to ways to improve museum exhibition design, the participants recommend two areas for improvement, having to do with exhibition development procedures and designers. Most participants discuss issues with the current exhibition development procedure. More than half of the participants stress the interdisciplinary nature of museum exhibitions, implying better communication and better understanding of each contributing member's role. Various suggestions also entail the need for flexibility, commitment, collaboration, and most important keeping the target audiences in mind throughout the design process. As for the designers, more than one participant recommend more formal training–involving cross pollination between interpretation and design–to make sure the designers understand museums and their functions as cultural institutions. D. Boivin (personal communications, February 11, 2010) also comments on the role of exhibit designers in particular; they need the ability to bridge between 2D (graphic) and 3D (exhibition) to create a true integration. In considering the challenges and areas for improvement, an increase in funding seems to be the most important and effective solution. It will help address many other issues, including keeping up with technology advancement, meeting the public's higher expectation, and allowing new approaches to improve the exhibition design mechanism.

AV/NM Database Analysis Findings

Macro-level analysis. Throughout the four zones of the CWM's permanent exhibition, there are 116 AV/NM individual units that have been taken into account in this thesis. Zone 1 contains 19 units, Zone 2 has 33, Zone 3 has 30, and Zone 4 has 34. The lower number of AV/NM units in Zone 1 is related to its smaller size. The unit with the highest number of technical components is 4.C.7.4-AV1 in Zone 4, which is on the *Story of Peacekeeping*; however, this unit is under reconstruction and thus is excluded from consideration in this thesis. The unit with the second highest number of components is 4.C.1.2-NM1 in Zone 4, which is about the *Cold War.* It has 17 components including five touch-screen computer interactive stations and two projections. The unit with the lowest number of technical components is in Zone 3, which has only two technical components, a DVD and a 17" LCD screen. It is a five-minute looped video on the *Survival in the North Atlantic.*

All the units with their total number of technical components are comparatively shown by zone in Appendix D. The average minimum number of technical components making up each AV/

NM unit is three Any units with more than eight technical components are considered relatively complex The units with the highest technical components from each zone are 1 D 2 4-AV1 with 12 technical components (*The Battle of the Plains of Abraham*), 2 F 3 1-AV1 with 15 components (*Human Face of War Personal Stories*), and 4.C 1 2-NM1 with 17 components (*Western Europe Deployment Map*) As for Zone 3, all the units with more than eight technical components are combined units and therefore excluded from consideration here The uncombined unit with the highest number of technical components is 3 E 7 4-AV2 with eight components (*The Normandy Campaign*)

In comparing the AV/NM database to the floor plans, some discrepancies were noted Certain AV/NM units are shown on the floor plan but not accounted for in the database and vice versa This is due to the fact that the database has been updated a few times since the Museum's opening, whereas the floor plans done during the development phase have not The findings from the macro-level analysis are nonetheless shown in a visual format in Appendix E, as most information is consistent Each zone's floor plan contains the location as well as the total number of technical components of the identified AV/NM units Note that the database does not contain any information on the AV/NM units beyond 4 E-AV1, and a section of the Zone 4 floor plan is therefore shaded in grey in Appendix E to indicate the area's exclusion

Micro-level analysis. For every entry in the database, there are two tiers of classification The first is according to each unit's main media type, either audiovisual (AV) or new media (NM) Out of the 116 units in the four zones, 104 are classified as audiovisual, while the remaining 12 are considered as new media Each unit is then further classified according to the kind of technology or the style of presentation it employs There are four subtypes to the main AV category audio, audiovisual, soundscape, and video The three subtypes of the NM category that are being considered for the purposes of this research are game, game with sounds, and interactive video (see Table 3 for the detailed breakdowns) The two units belonging to the *other* NM subtype, including database and Power Point presentation projection, are excluded By comparing the media/presentation subtypes of all the AV and NM units shown in Figure 2, the two most predominant among the AV units are audio (32%) and audiovisual (35%), while interactive video (41%) is the most common among the NM units

Table 3

Detailed Breakdowns of Each Zone's Main and Subsidiary Media Type

	AV subtypes				NM subtypes				
Zone	A	AV	S	V	G	GS	IV	O	Total
1	9	5	2	2	0	0	1	0	19
2	12	8	5	5	0	1	0	2	33
3	5	12	4	6	1	0	2	0	30
4	7	12	5	5	2	1	2	0	34

Note. A = audio; AV = audiovisual; S = soundscape; V = video; G = game; GS = game with sound; IV = interactive video; O = others.

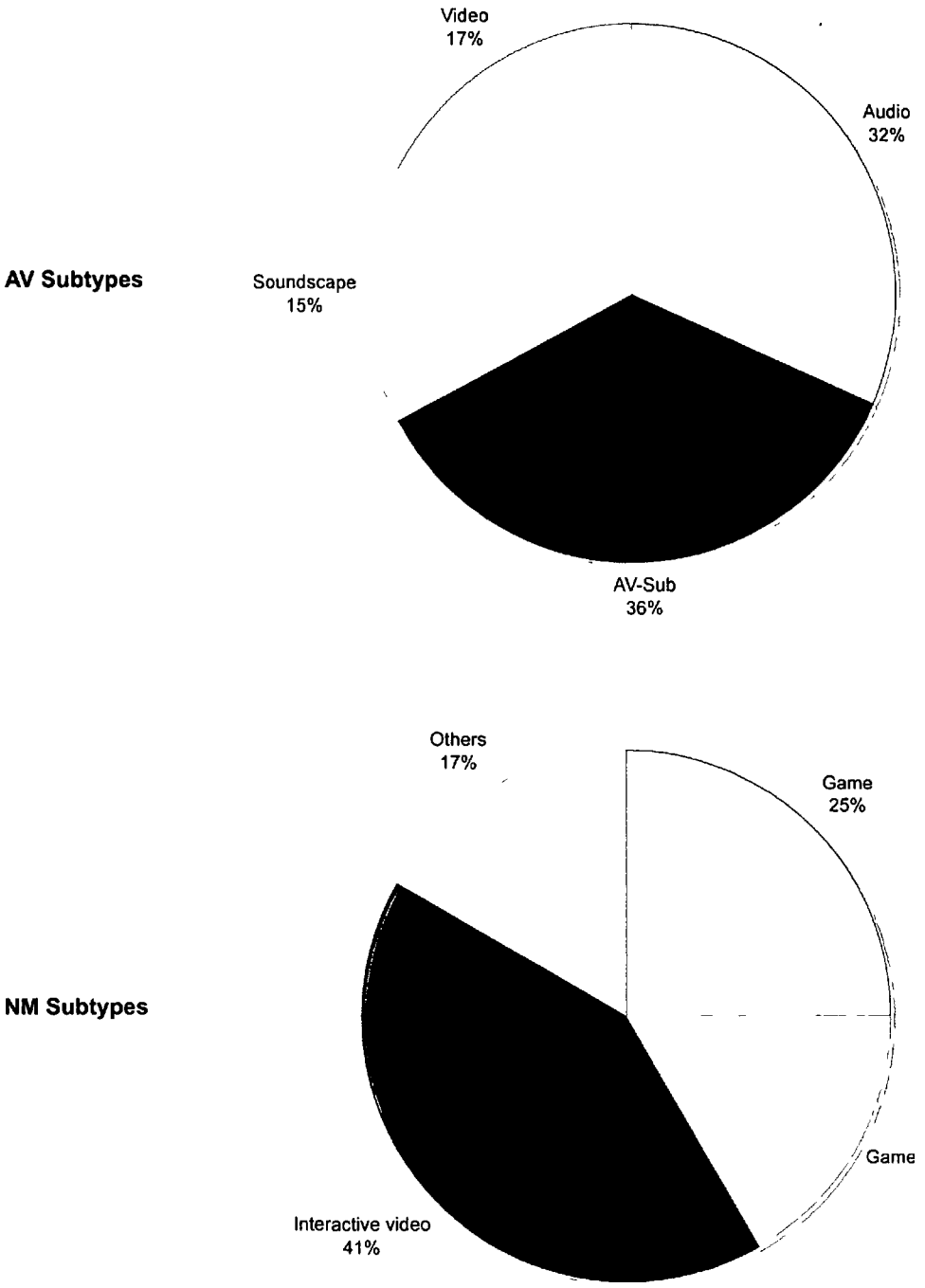

Figure 2. The pie charts illustrate the percentage of various media/presentation subtypes used within the CWM's permanent exhibition. These subtypes are classified under two main categories, audiovisual and new media.

With these three dominant subtypes in mind, the analysis that follows establishes the range of technical components for each subtype (shown in Table 4) by referring to the total number of technical components for all the AV/NM units from the macro-level. This ultimately leads to the unit selection for the eventual descriptive visual analysis, including ten units in total. Two units, representing the maximum and minimum number of technical components, are to be examined for each of the three high-range subtypes (audio, AV, and Interactive video). However, only one unit is to be looked at for those subtypes with a small range (soundscape, video, game, and game with sounds).

Taking into consideration the specific types and numbers of technical components of each unit, it becomes apparent that there are at least two functions to each component: its technical purposes and its sensory purposes. Each component thus serves either as one or as a combination of three technical purposes: input, output, and interface. As for the sensory purposes, each component can be regarded as either one or a combination of three main sensory stimuli: visual, auditory, and tactile. For example, DVD is considered as technically both a content input and a content output; it also provides visual stimuli. The following table (Table 5) details the functions of all 20 technical components that are deemed pertinent to this thesis's analysis of exhibition communication. This allows the units under investigation to be compared more objectively, particularly concerning the correlation between the unit's technical component number and the complexity and importance of its messages. The information is applied to performing the descriptive visual analysis and is demonstrated in the next section.

Table 4

Comparison of Technical-component Range for Each AV/NM Subtype

		Number of technical components		
AV/NM subtype	Units	Max	Min	Range
Audio	33	15	3	12*
AV	37	31	4	27*
Soundscape	16	8	4	4
Video	18	8	2	6
Game	3	3	3	0
Game with sounds	2	4	4	0
Interactive video	5	17	3	14*

Note (*) denotes three high-range AV/NM subtypes

Table 5

Technical and Sensory Purposes of Each Component Type

Technical-component type	Technical purposes	Sensory purposes
DVD	Content input/output	Visual
20" CRT display	Content output	Visual
17" LCD display	Content output	Visual
36" CRT display	Content output	Visual
53" CRT display	Content output	Visual
Projector	Content output	Visual
42" Plasma display	Content output	Visual
CD	Content input/output	Auditory
Amplifier & Controller	Content output	Auditory
Cone speaker	Content output	Auditory
Grid speaker	Content output	Auditory
Wall speaker	Content output	Auditory
Headphones	Content output	Auditory
Handset	Content output	Auditory
Single button	User interface	Tactile
12-button keypad	User interface	Tactile
AV cabinet	Content input/output	Tactile*
Media system	Content input/output	Visual/auditory/tactile
PC	Content input/output	Visual/auditory/tactile
Touch screen	User interface	Visual/tactile

Note. AV cabinet can be considered as tactile stimulus if it is exposed to the audience.

Descriptive Visual Analysis

With the findings from the AV/NM database analysis, a list of AV/NM units to be examined for the descriptive analysis was drawn up. It contained ten preferred units and nine alternative units (see Appendix C). G. Ogden provided his input on ten out of 19 units from the list: 2.F.3.1-AV1, 2.D.1.6-AV2, 1.D.2.4-AV1, 1.D.2.2-AV1, 2.C.3.2-AV1, 2.D.1.6-AV1, 3.B.4.9-NM1, 2.C.1.4-NM1, 4.C.1.2-NM1, and 1.B.2.2-NM1. J. Creelman was also able to offer her opinion on six units: 2.F.3.1-AV1, 1.D.2.4-AV1, 1.D.2.2-AV1, 2.C.3.2-AV1, 2.D.1.6-AV1, and 2.C.1.4-NM1. Only the video subtype was not discussed, as neither of the two participants was familiar with either of the units.

In reviewing all the data collected from interviews and exhibition visits, the classification of the ten examined units is slightly modified. The three prominent media types of AV/NM units in the CWM's permanent exhibition are: audiovisual, audio, and touch-screen interactivity. To ensure that the descriptive visual analysis is concise and logical, the ten examined units are regrouped as follows. First, the three units under the AV subtype are all analyzed under the *audiovisual media* subsection. Second, a *sound media* subsection is created to collectively analyze the three sound-related units/subtypes: audio (high), audio (low), and soundscape. Third, all the different subtypes under the NM category are consolidated and now belong to a *touch-screen interactivity* subsection, as they all are principally touch-screen computer interactive units. The technical components of these different subtypes under the NM category are consistent; these units only differ in the style of on-screen presentation of the content that had been programmed with software. This results in an exclusion of 3.B.4.9-NM1 and 1.B.2.2-NM1 from the following analysis. Each of the remaining eight units is described according to the following aspects: physical context, technical components of the media used, and the unit's themes and messages (both provided content for the audiences and the curatorial intent).

Audiovisual media.

The Battle of the Plains of Abraham and Its Consequences (1.D.2.4-AV1). This unit is a theatre experience that lies at the heart of Zone 1–*Wars on Our Soil from the Earliest Times to 1885.* As part of the *Battle of the Plains of Abraham* story line, it is situated in between the *Battle Lines* passageway and the *30 Minutes That Changed Canada* section. It is considered an

AV unit with a considerably high number of technical components (12, including one DVD, one projector, four grid speakers, three single buttons, one media system, and two AV cabinets).

From a technical perspective, this is an automatically looped DVD presentation projected onto a single wall screen, alternating between English and French versions with subtitles. The presentation is 14 minutes in duration, seven minutes in each language. Within the round perimeter of the theatre, there are three rows of two rectangular backless cushioned benches. The theatre area also contains four grid speakers mounted on the ceiling, which are controlled by a preprogrammed media system. The overall lighting is dim, with the main illumination around the seating area.

Prior to entering the theatre, visitors encounter an introductory floor-to-ceiling graphic panel titled "Battle for Canada: The Battle of the Plains of Abraham." The panel background includes a mixture of national references, such as the French *fleurs de lis*. A secondary-level text states the unit's main message, "One hundred and fifty years of French-British conflict in North America ended in the Seven Years' War and the British conquest of Canada." Underneath is a small label–a presentation introduction:

> **The Battle of the Plains of Abraham**
> *Meet Jacques, Dave and Paul as they watch history, and Hockey!*
> This presentation alternates between English and French.
> (7 minutes)

At the beginning of the presentation, the audiences are presented with a series of questions, with later-revealed answers, concerning the Battle's context. After the Battle's background information, the presentation adopts a dramatized film approach, containing three characters: Jacques, Dave, and Paul. Each character represents the Canadian population: the Francophone, the Anglophone, and the Native. Each character also wears a different Canadian hockey team's jersey: those of the Montreal Canadians, the Toronto Maple Leafs, and the Vancouver Canucks. While sitting on a couch watching a hockey game on television, the three characters stumble upon a program on the subject of the Battle of the Plains of Abraham, which leads to a discussion of the views each character represents. The film switches back and forth between the dramatized skit focusing on the three characters' dialogue and the documentary content. The documentary program is narrated by a female voice telling the history of the Battle of the Plains of Abraham with the aid of an assemblage of archival materials, including: illustrated maps of the Battle, drawings of the Battle scene, and portraits of key personnel.

Figure 3 Images of the *Battle of the Plains of Abraham* theatre experience showing both physical setting and on-screen captures Taken on site at the CWM's permanent exhibition, Ottawa (April, 16, 2010)

According to the CWM's acting manager of Programs and Interpretations (G. Ogden, personal communication, April 16, 2010), the intent is to communicate powerfully an important message about the Battle of the Plains of the Abraham in an active, dynamic, and captive setting. The message is the consequence of the Battle, which was the foundation of bilingualism in Canada today. The physical setting is designed to allow visitors with space and duration for viewing. As for the structure and content of the AV presentation, the deliberate use of a dialogue between three contemporary characters is to allow members of the diverse audiences to identify themselves with the characters in the presentation. The interpretive planner, (J. Creelman, personal communication, May 7, 2010) asserts that the use of three characters and humour in the dramatized presentation is a way to soften the sensitive, extremely loaded, and polarizing nature of the subject matter.

The Battle Lines (1.D.2.2-AV1). This passageway is another AV presentation that forms part of the *Battle of the Plains of Abraham* story line. It is located between the *Clash of Empires* section and the *Battle of the Plains of Abraham* theatre experience. This AV unit consists of ten technical components, including: two DVDs, two projectors, four grid speakers, and two AV cabinets.

From a technical point of view, this unit comprises two looped footages on DVD projected onto two opposite walls. On each wall is mounted a large screen approximately two meters in height and 40 centimeters from the floor. These two large screens, being approximately two and a half meters apart face to face, form a three-meter long passageway. A speaker is mounted at the top corner of each screen. Although there is no direct lighting in the passageway, the lighting from its surroundings and the projections illuminate the site.

Upon approaching the *Battle Lines* passageway, the audiences are presented with a reconstructed stone archway reading "1759: Battle for Canada." There is no explicit introductory label. Adjacent to the archway on the left side is a graphic panel with the title "1759: The Plains of Abraham." The secondary message on the graphic panel reads:

> *Quebec City was the only place where the French could lose and the British could win the Seven Years' War in North America.*
>
> In 1759, a British army sails for Quebec. When they arrive, the battle for Canada will begin.

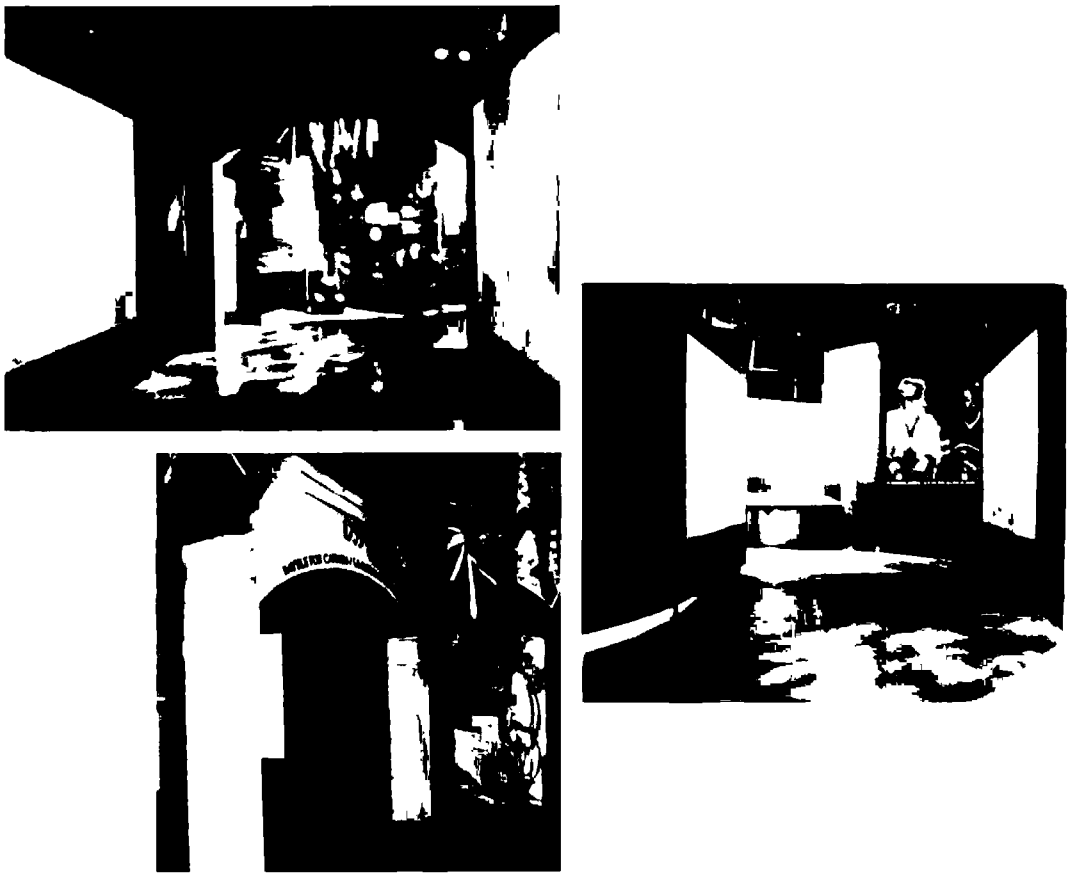

Figure 4 Images of the *Battle Lines* passageway showing both physical setting and wall projections. Taken on site at the CWM's permanent exhibition, Ottawa (April 16, 2010).

Walking through *Battle Lines*, one hears sounds of command and gunfire without any narration. The footage projected on the left screen shows a troop in red tunics representing the British. On the right screen is a troop in blue uniforms representing the French. Both are composed of various clips from a re-enacted battle film, including close ups of soldiers, front lines, and battle scenes. Upon leaving the passageway, the audiences immediately walk into the *Battle of the Plains of Abraham* theatre experience.

The curatorial intent is to give the visitors a one-to-one scale experience of being in the battlefield. The surrounding setup is deliberate; by going through the archway–representing the door of the fort at Quebec City–the visitor moves from Quebec City onto the Plains of Abraham. It is intentional to put the British on one side and the various French forces on the other in reconstructing the battlefield, which then allows the audiences to experience the exchange of fire and the charges that had taken place.

In terms of technology, the main challenge had to do with the projection distance; the historians' original idea was to have projection right down to the floor for a more consummate simulation. The AV unit's content benefited from the CWM's partnership with CBC in terms of *Canada: A People's History* footage. J. Creelman (personal communication, May 7, 2010) notes that the available footage was the main driving force behind the choice of media.

Canadian Woman Reacts to Shock of War (2.C.3.2-AV1). This AV presentation is part of a subtheme called *Home Front 1915.* It is located before the *Trench Experience* and after the *Second Ypres* sections. The AV unit has a considerably lower number of technical components (five, including one DVD, one projector, one cone speaker, and two AV cabinets).

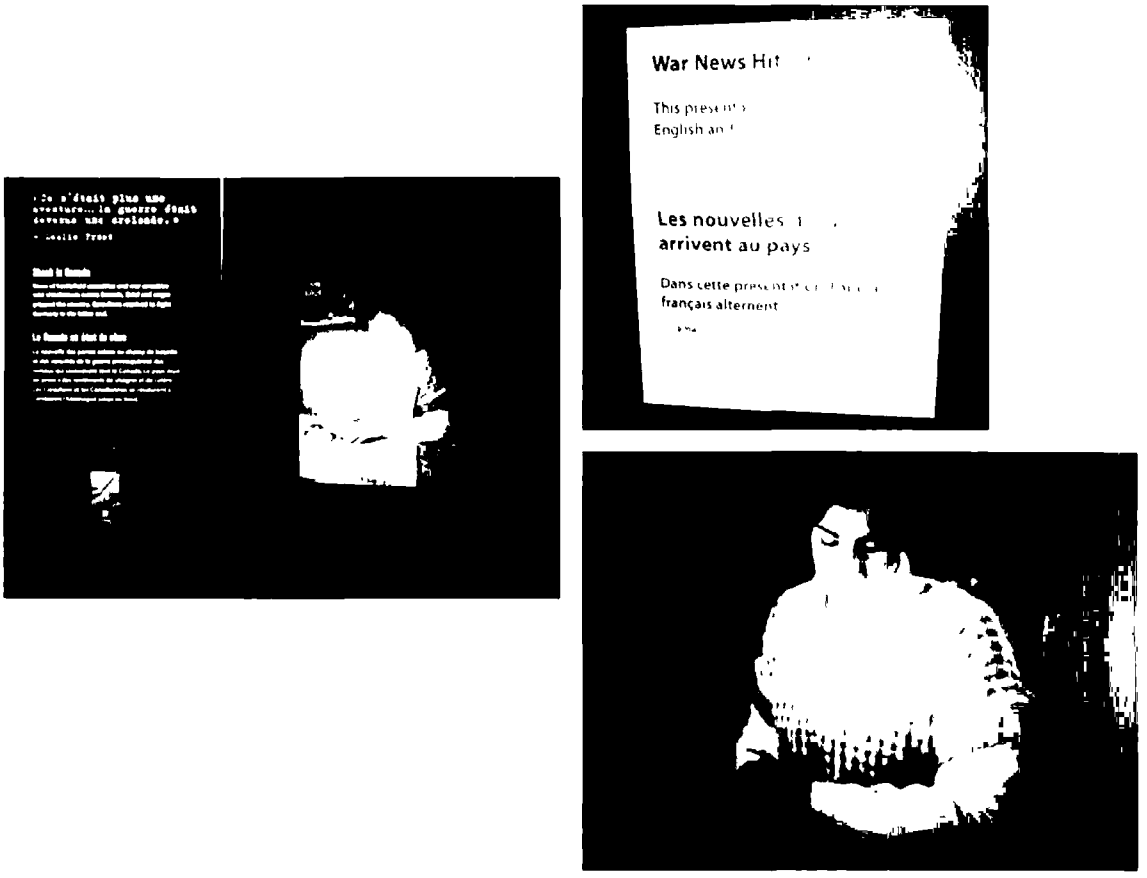

Figure 5 Images of the *Canadian Woman Reacts to Shock of War* presentation showing both graphic panels and on-screen capture Taken on site at the CWM s permanent exhibition Ottawa (April 16 2010)

From a technical perspective, this unit can simply be described as a looped DVD on screen, alternating between French and English. The sound for this particular AV unit is through a cone speaker, which is mounted on the gallery's high ceiling, above the audiences. This AV unit is also contained within an independent wall panel. The deep blue wall panel, although it contains no graphic, has a screen inset with some texts on its left side. There are three levels of text on this panel: a testimonial statement, the panel's theme, and an AV introductory label. All is printed in white and reads as follow:

> "It was no longer an adventure... The war had become a crusade."
> –Leslie Frost
>
> **Shock in Canada**
> News of battlefield casualties and war atrocities sent shockwaves across Canada. Grief and anger gripped the country. Canadians resolved to fight Germany to the bitter end.
>
> **War News Hits Home**
> This presentation alternates between English and French.
> (Dramatized, 1:30 minutes)

The AV presentation features an actress dressed in costume of the First World War period. Her on-screen scale is close to real life. The film shows the woman sitting in her home by a table with a cup of tea next to her while reading a newspaper *Le Devoir*. She then engages in a monologue addressing the viewer as she reacts to what she has just read from the newspaper.

The curatorial intent for this AV presentation is to communicate a sense of response and passion to the events during the First World War on a one-to-one scale. The approach taken was then to create a script from a first-person point of view based on research in archival materials. The actress delivering the script represents a wife or a mother of a soldier in the Canadian Expeditionary Force. J. Creelman (personal communication, May 7, 2010) explains that given the very limited female representation throughout the entire permanent exhibition and the Museum, this AV presentation helps the CWM connect with female visitors. In terms of design, G. Ogden (personal communication, April 16, 2010) points out that this AV unit uses a sound cone, which can be difficult to hear and the unit's location is on the main circulation route, which makes it more of a transit area.

Analysis. In comparing the three AV units above, it is apparent that the number of technical components corresponds to the design of the unit's contextual setup, which then relates to the importance of the presented subject matters and its messages. *The Battle of the Plains*

of Abraham theatre experience and the *Battle Lines* passageway are used for very important subject matters. The main message of these two units concerns the foundation of Canadian bilingualism. The units consequently received more elaborate treatment in their physical design and presentation.

In looking more specifically at the content of the AV presentation, its structuring does indicate the complexity of the subject matter. This can be seen both in the form of dramatization and the amount of content being presented. For instance, the AV content on the Battle of the Plains of Abraham includes three characters representing various views and a variety of other archival materials. This is quite a contrast to the assemblage of war re-enactment footage of the *Battle Lines* passageway and the first-person dialogue of the *Canadian Woman Reacts to Shock of War* presentation.

A common aspect among the three units is the dramatized style of the presentation content. One may argue that this is unavoidable given the periods of history being presented, which is before the invention of films. However, the dramatization also serves several other purposes: to help engage and contextualize the audiences, to soften the subject matter using either humourous or realistic style, and above all to tell a story in a dynamic and sensory-appealing manner. The fact that these presentations are looped and structured in one certain sequence suggests a somewhat one-way communication, although there is an attempt to engage the audiences in a dialogue using questions and answers and characters.

Table 6

Comparison of Technical Components of AV Media

	Number of technical components			
Unit	CI	VO	AO	ACO
The Battle of the Plains of Abraham theatre experience 1.D.2.4-AV1	2	1	4	5
The Battle Lines passageway 1.D.2.2-AV1	2	2	4	2
Canadian Woman Reacts to Shock of War presentation 2.C 3.2-AV1	1	1	1	2

Note CI = content input; VO = visual output; AO = audio output; ACO = AV cabinet and others

Sound media.

The Trench Experience (2.D.1.6-AV1). The reconstruction is a recreated immersive subterranean environment with a soundscape, evoking the experience of soldiers on the front line of the Western front during the First World War. It is one of the key exhibits in Zone 2–*The South African and First World Wars, 1885-1931*, following the *Home Front 1915* section (where the audiences learn about the *Shock of War*).

The unit is classified as a soundscape (a subtype of the main AV media type). It contains eight technical components, being one of the soundscape units with the highest number of technical components throughout the entire permanent exhibition The notable technical components include one CD, six grid speakers, and one AV cabinet. From the technical point of view, the soundscape uses a looped CD of eight minutes long, with the sounds being distributed among the six speakers mounted on the ceiling at various corners of the *Trench Experience* unit.

Before entering the *Trench Experience* reconstruction, there is no explicit introduction to the area. The unit's entrance and exit are in fact surrounded by other exhibition elements of the same theme (*Trench Warfare*), including wall graphic panels with enlarged images, a scale model of the trench system with interactive buttons, and various display cases of artifacts. The main themes and messages of the *Trench Experience* are perhaps presented at the beginning of the overall *Trench Warfare* section, although this is not specifically indicated. The *Trench Warfare* section's introductory wall panel reads:

> **In the Trenches**
> The trench system became more elaborate as the war progressed. By day, soldiers prepared or improved their defences and tried to sleep; by night, they attacked in trench raids, or defended against them. Artillery, snipers, disease, and accidents threatened life relentlessly.

Figure 6 Images of the *Trench Experience* reconstruction with a soundscape showing both physical setting and props The bottom right image shows the *Field Telephone* audio unit Taken on site at the CWM s permanent exhibition Ottawa (April 16 2010)

The audiences are immersed in the *Trench Experience*, as they pass through the frayed burlap hung from above, partitioning between the main exhibition area and the reconstruction. The visitors then follows a path that is a maximum of one and a half meters wide (enough to accommodate visitors in a wheelchair). The reconstructed path mimics a hard subterranean texture with each side lined with corrugated metal sheets held in place by wooden posts. Above the subterranean level, each side of the walls is also lined with sand bags stacked on top one another, to another half a meter in height. The floor has a coarse wooden texture throughout the looped path. There are also props and mannequins dressed in uniform, set along the recreated dugout path, as well as shovels, helmets, rifles, and water canisters.

While walking through the simulated *Trench Experience*, the audiences hear a soundscape that consists of bombardment sounds, gunshots, bird chirping, human breathing, soldiers communicating commands, and some narration. The space is dimly illuminated with some green UV lighting. There are no graphics or images within the *Trench Experience* unit. There are, however, two mock trench periscopes through which the audiences are presented with soundless, black and white footage of war scenes.

From the curatorial point of view, the intent is to communicate an experience of being in a trench during the First World War. The reconstruction allows the visitors to go into the space and physically interact with props and simulated details to get a sense of such an experience. G. Ogden (personal communications, April 16, 2010) emphasizes the simulative nature of the representation on a one-to-one scale, which helps to underline the hardship of trench warfare. The use of a soundscape–a form of audio narrative–further helps create the intended experience. The scripted sounds convey periods of relative calm, of routine, and of intense fighting and terror.

In terms of design, the original intent was to coordinate the soundscape with the lightscape. However, the final product is not what was intended. G. Ogden (personal communications, April 16, 2010) remarks that like the *Battle of the Plains of Abraham* AV presentation, many media have been used to create a powerful experience to really stress the importance of the message. The choice of the experiential approach is partly based on the popularity and success of a trench reconstruction at the former location of the Museum and in other places; "The trench recreation had been the tried and true way of presenting that" (J. Creelman, personal communication, May 7, 2010).

The Field Telephone (2.D.1.6-AV2). Along the *Trench Experience* reconstructed path, there is also an elaborate dugout hole on the simulated wall that contains props, such as a bottle, a pistol, and a small wooden trunk With no illumination except for the ambient lighting of the overall *Trench Experience* unit, one finds a smaller opened box sitting on the wooden trunk There is a handset inside the smaller box, representing a period trench field telephone

Within the *Trench Experience* reconstruction, the *Field Telephone* is an independent audio unit (under the main AV media type) and the only interactive element in addition to the periscopes It has three technical components one CD, one grid speaker, and one AV cabinet The audio, of 15-30 seconds in duration, is triggered when the handset is lifted However, there is no textual or graphic indication of its presence or usage instructions around the audio unit Once the telephone is lifted, the audiences listen to official communication that took place in the trench

The inclusion of this audio unit forms part of the wider messages of the *Trench Experience* It enables the visitors to get a sense of the communication on the front line It adds texture to the whole story line while inviting the visitors to spend more time and go into the recreated dugout area It also serves as a reward to the audiences for exploring, since it is not located in an obvious spot

Human Face of War: Personal Stories (2.F.3.1-AV1). This audio unit forms part of the 2F theme It is situated right after the Passchendaele recreated battlefield It is an audio subtype unit (under the main AV media type) with the highest number of technical components in the permanent exhibition The 15 components are three CDs, three headphones, three six-button keypads, and six AV cabinets These components were intended for three audio stations, however, there are only two stations on site

The audio unit technically comprises two stations Each station, with a pair of headphones attached, allows the audiences to listen to six audio CD tracks, each approximately two minutes long The station is activated once the visitor selects one of the six stories, three in English and three in French, using the six-button keypads

Figure 7 Images of the *Human Face of War Personal Stories* audio unit showing both physical setting and audio device Taken on site at the CWM s permanent exhibition Ottawa (April 16 2010)

Having walked through the dimly lit reconstructed battlefield of Passchendaele, the audiences are confronted with a brightly lit wall graphic panel titled, "The Face of Battle." The panel's background is a blown-up, black-and-white image of several soldiers on the marshy battlefield terrain. Superimposed on the background image are eight, black-and-white, square-cropped images, slanting across the panel along its main title. The images depict more in detail soldiers who had been injured or killed as well as the physical context. The main message reads:

> **The Face of Battle**
> *The experience of war terrified even the bravest soldier.*
> How did soldiers survive on the battlefield? How did they keep from breaking under the strain? Why did they keep fighting? Soldiers found ways to cope with and endure the terrible environment of trench warfare.
>
> Listen to soldiers' testimonials, drawn from their letters, diaries, and postwar interviews, about their experiences on the Western front.

Located in front of the wall graphic panels are two grey cushioned armchairs with a small, low console in between them. On the console are a text label and two six-button keypads on each end. Each button is numbered from one to six. Underneath the label, there are two cutout holes where headphones rest. The label indicates:

> **Face of Battle**
> *Listen to Canadian soldiers in the nightmare world of the trenches.*
> 1. How I Endure...
> 2. On the Battlefield..
> 3. Death and Destruction...

Each number's caption also includes its duration as well as a disclaimer saying, "dramatized." Numbers four to six are French versions of the same content (see Figure 7).

Once selected, the audio begins with a female narrative voice to introduce the track and then the male actor's voice commences to tell the soldier's account of the war. While visitors sit and listen to the dramatized audio, they are facing the Passchendaele reconstructed scene. The ground imitates the terrain texture with a wooden path around a swamp where a dead-soldier mannequin in uniform is lying face down and half drowned. On the wall at the end of the reconstructed floor is a black-and-white enlarged image of an eerie wiped-out battlefield showing the dreary horizon.

The curatorial intent is "to communicate the human experience of war" by allowing the audiences to listen to the accounts of those who have experienced it (G. Ogden, personal

communications, April 16, 2010). The dramatized scripts are based on research into testimonies, and on quotations from soldiers. The messages about the impact of war on the individual are conveyed by the use of the human voice in combination with images; the use of headphones instead of handsets, as in other areas, further creates a sense of intimacy (J. Creelman, personal communications, May 07, 2010). The comfortable seating area is also deliberate; it invites the visitors to sit down and listen. The option and sequencing of three different audio accounts speak to a greater volume of content. They also make the audiences aware of various types of experiences on the front line. The sense of intimacy and physical comfort around the audio unit contrast with the scene and scale of the desolate reconstructed Passchendaele battlefield right in front of it.

Analysis. The three units (*Trench Experience*, *Field Telephone*, and *Human Face of War: Personal Stories*) are comparable, although two are classified as audio units and the other as a soundscape, because their main output is sound. In examining these three units, it is clear that sound is an important element in narrative-oriented exhibitions, to tell the story and place the audiences in context. In the case of *Human Face of War: Personal Stories*, the complexity and volume of content is directly related to the number of technical components. This is demonstrated by the curator's decision to break down the content into sections, which makes the information readily accessible while emphasizing various experiences that took place. Thus the number of technical components more specifically depends on the content structure and sequencing. Both the *Trench Experience* soundscape and the *Field Telephone* audio, in comparison, have a linear content structure in which one audio track is repeated with no audience input allowed.

Table 7 shows that each of the three units contains one source of content input. They vary in output channels. The scale of the *Trench Experience* reconstruction requires more audio output in comparison to the other units, which have only one audio output each (*Human Face of War: Personal Stories* is one unit with two identical stations as shown in Figure 7). The previous analysis in the AV-media subsection indicates the importance of the messages, which drive the contextual setup, resulting in the number of technical components and the unit's complexity. This sound-subsection analysis demonstrates how the curatorial intent (on how and to what extent the messages should be learned) can add to the complexity of design and presentation.

Table 7

Comparison of Technical Components of Sound Media

	Number of technical components			
Unit	CI	AO	UI	ACO
The Trench Experience reconstruction 2.D.1.6-AV1	1	6	0	1
The Field Telephone audio 2.D.1.6-AV2	1	1	0	1
Human Face of War: Personal Stories unit 2.F.3.1-AV1	1 (x2)	1 (x2)	1 (x2)	1 (x2)

Note. CI = content input, AO = audio output; UI = user input; ACO = AV cabinet and others, (x2) indicates the two identical audio stations that make up the overall unit of *Human Face of War: Personal Stories*

Interactive media.

Western Europe Deployment Map (4.C.1.2-NM1). This is an interactive video unit (under the main NM media type) that resembles a command centre or situation room during the Cold War. It is one of the biggest interactive exhibits within the permanent exhibition and is dubbed as the *NATO Hub* with the high number of 17 technical components. It contains two projectors, five AV cabinets, five PCs, and five touch screens.

From the technical perspective, each station is an interactive video, which can be manipulated by the audiences using the touch screen. There are also two projections on two wall screens mounted above the five stations showing two versions of looped *Third World War* simulations. The entire unit provides no sound. Within the circular hub-like area, the interactive unit has five stations on two separate consoles with a chair bolted down to the floor for each station. The two consoles form a curve, one with two interactive video stations and the other with three. A column separates the two consoles, on which an actual alert status board is mounted. Between the two consoles, there is also a sophisticated PC tower that hosts the five PCs, sitting on the floor.

Figure 8. Images of *Western Europe Deployment Map* interactive hub showing both physical setting and touch-screen displays. Taken on site at the CWM's permanent exhibition, Ottawa (April, 16, 2010).

Red spotlights from the ceiling and lights from the surroundings illuminate the space. Nonetheless the overall ambiance still remains dark. There are no graphics within this unit except for two four-by-six inch images with captions on each console. Across from the consoles is a curved wall panel with text forming the perimeter of the hub. The panel reads:

> **Watching, Waiting**
> The Cold War was a potentially deadly waiting game. In situation rooms and command centres like this one, military and civilian authorities on both sides watched one another's every move and prepared to sound the alarm for war if an attack appeared likely.

The two consoles are made of painted bent sheet metal. The top surface of the consoles has sets of cutouts to imitate switchboards for each of the five stations. The cutouts are then underlain with dials and backlit graphics. Although the console may seem to be interactive, only the actual touch screen is.

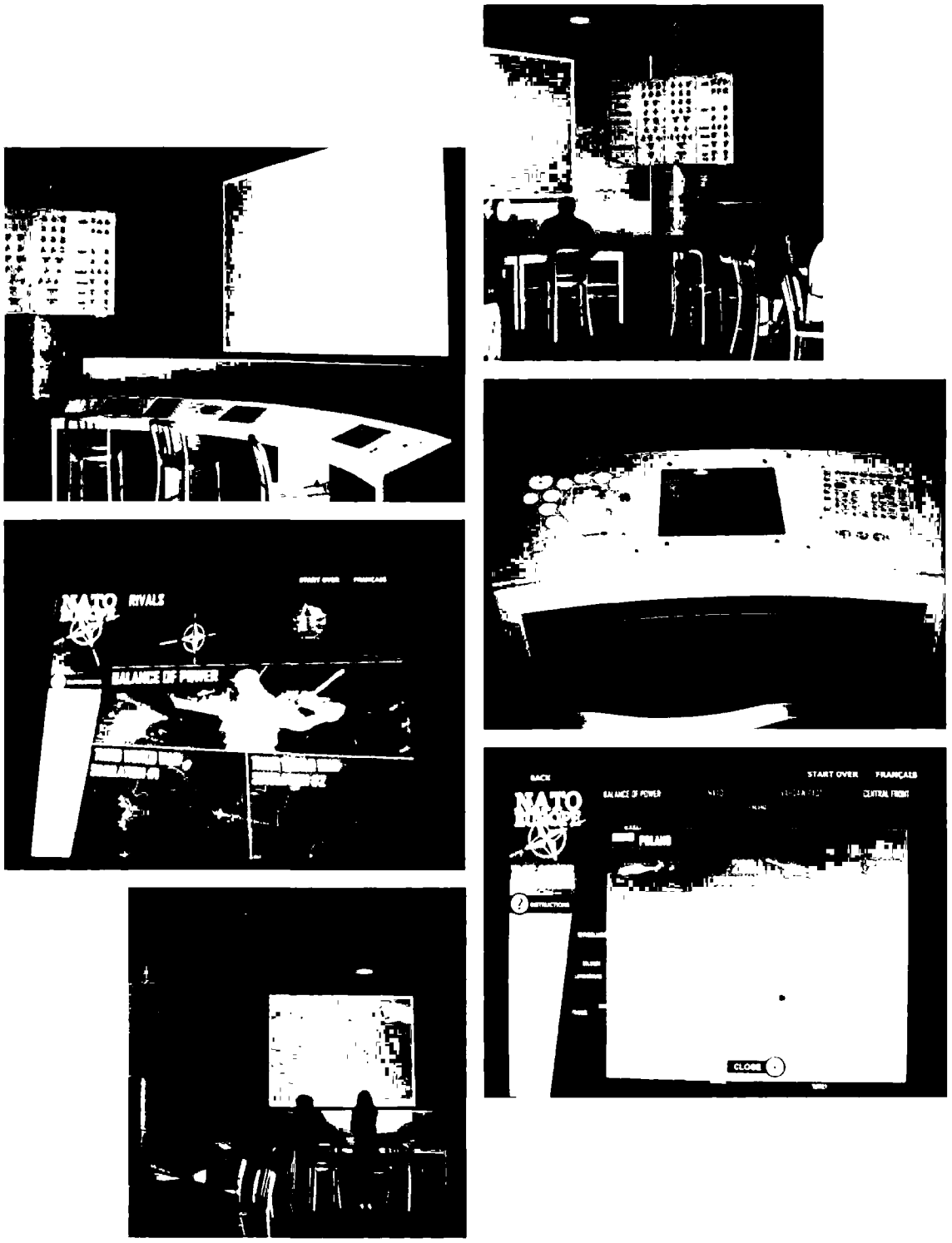

Figure 8 Images of the *Western Europe Deployment Map* interactive hub showing both physical setting and touch-screen displays Taken on site at the CWM s permanent exhibition, Ottawa (April 16, 2010)

Looking at the touch screen, the audiences are invited to start the *NATO Europe* programmed computer-interactive video in either French or English. Once started, there is an instruction on the left-hand column, asking the viewer to select one of the four topics on the screen: *Rivals*, *Balance of Power*, *Third World War Simulation #1*, and *Third World War Simulation #2*. At all times there is the option of starting over or switching to the other language. Upon selecting each topic, the audiences are prompted to make further selections to access layers of information. The programmed information entails the background information as well as each country's contribution, which are presented in various forms including maps, charts with figures and icons, and pop-up windows with text description (see Figure 9 for the unit's information architecture). The overall graphic style of the presented content resembles that of spacecraft-war video games. The two *Third World War* simulations are included both on each interactive video station and the wall projections; however, they are independent of one another.

According to G. Ogden (personal communications, June 9, 2010), the curatorial objective for this unit is to communicate several things: (a) "the potential threat of World War III, which NATO in particular planned, trained, and was ready for throughout most of its existence during World War II, especially in Europe;" (b) "Canada's role as part of the North Atlantic Treaty Alliance, in terms of having a presence in Europe;" and (c) the importance of the message by giving it such a large physical presence in the space. The intent is to provide both database content and simulation and to mirror an aspect of popular culture in the form of a war game scenario. G. Ogden, however, emphasizes that the simulations are based on accurate scenarios and have a scholarly underpinning. The multiple numbers of interactive stations within the unit are also to create a group experience and visual impact. With the inclusion of two large-screen projections, it adds a dynamic element to the message communication and prolongs the opportunity to hold audiences' attention. Finally, with the use of computer interactive, the content can be easily updated in the future.

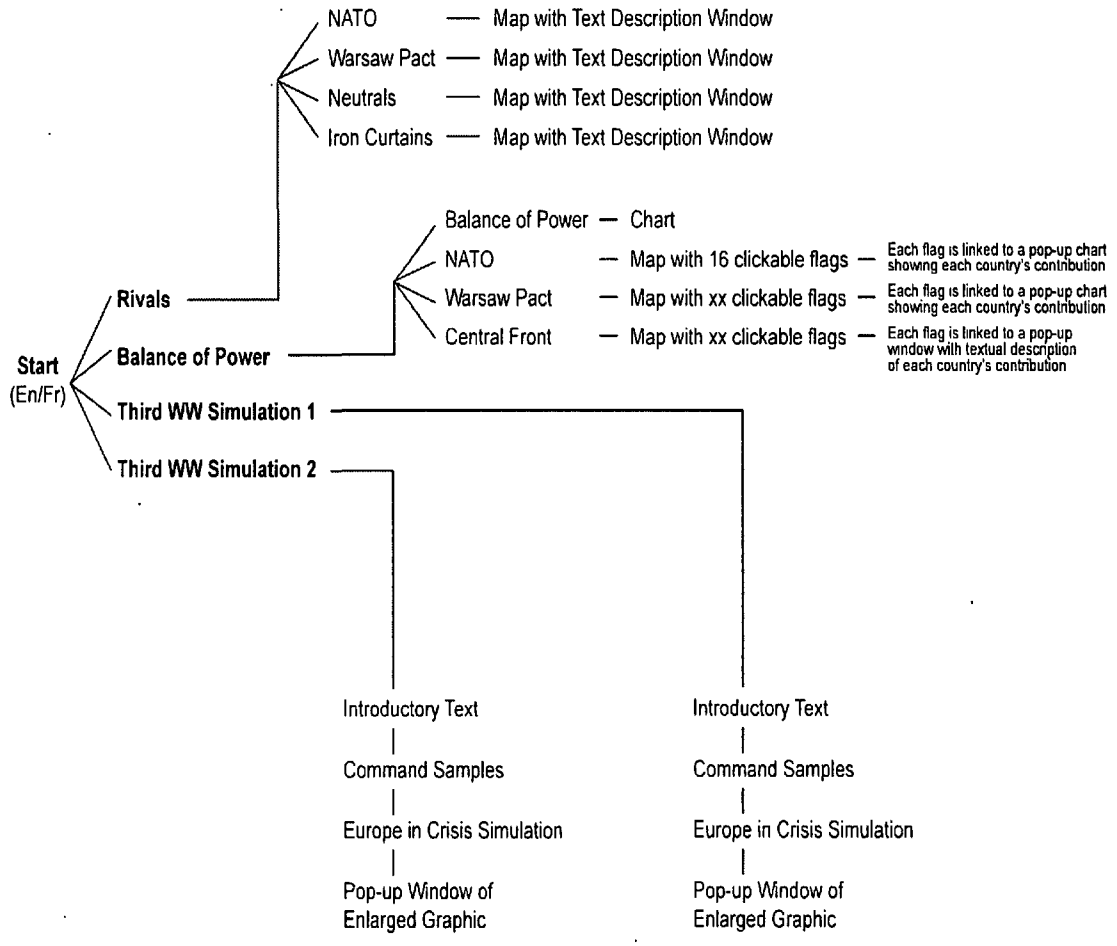

Figure 9. Information architecture of the *Western Europe Deployment Map* interactive video shows a complex, multilayered structuring of the messages that has been programmed in the computer unit.

The Military Intelligence Quiz (2.C.1.4-NM1). This interactive unit is part of the *Eager to Enlist* story line in the *First World War* zone It is considered to be a game with sound (under the main NM media type) with four main technical components, including one headphone, one AV cabinet, one PC, and one touch screen The *Military Intelligence Quiz* interactive game is technically a self-standing unit with an inset touch screen and PC The programmed content contains a sound element conveyed through a pair of headphones, which is hung on a hook on a graphic wall panel against which the interactive unit is placed In front of the unit is a small, rectangular, cushioned stool There is no label around the interactive unit as the audiences are introduced to the *Military Intelligence Quiz* through an on-screen presentation

The audiences are first introduced to a comically illustrated military sergeant The welcome page reads, 'Test Your Military Intelligence" on one side with the French equivalent on the other After the viewer clicks *Start*, there is an instruction column on the left hand side with the options of starting over or switching to the other language, consistent with the *Western Europe Deployment Map* interactive video The audiences are engaged to interact with the programmed content in two ways, reading the sergeant's instruction on the screen and/or listening to the identical instruction in a male actor's voice using the headphones

The *Military Intelligence Quiz* content consists of only five questions with four multiple-choice answers to each The sergeant's voice narrates both questions and answers With a correct answer, the audiences are provided with the context information followed by the sergeant's praise With an incorrect answer, the correct information is provided along with a remark from the sergeant At the end of the five questions, the audiences have the choice of retaking the quiz The overall graphic style of the presented content is simple, with a comic-like military feel to it

The intent is to impart information about the size and role of the Canadian Expedition Force on the Western Front without flooding the visitors with one information panel after another The use of a touch-screen computer interactive in a quiz format allows for a conducive and accessible communication of facts and figures J Creelman asserts that a quiz seems to be a tried and true way of imparting technical content in an engaging and effective manner Another advantage of using a computer interactive has to do with the ease of updating and changing content through software

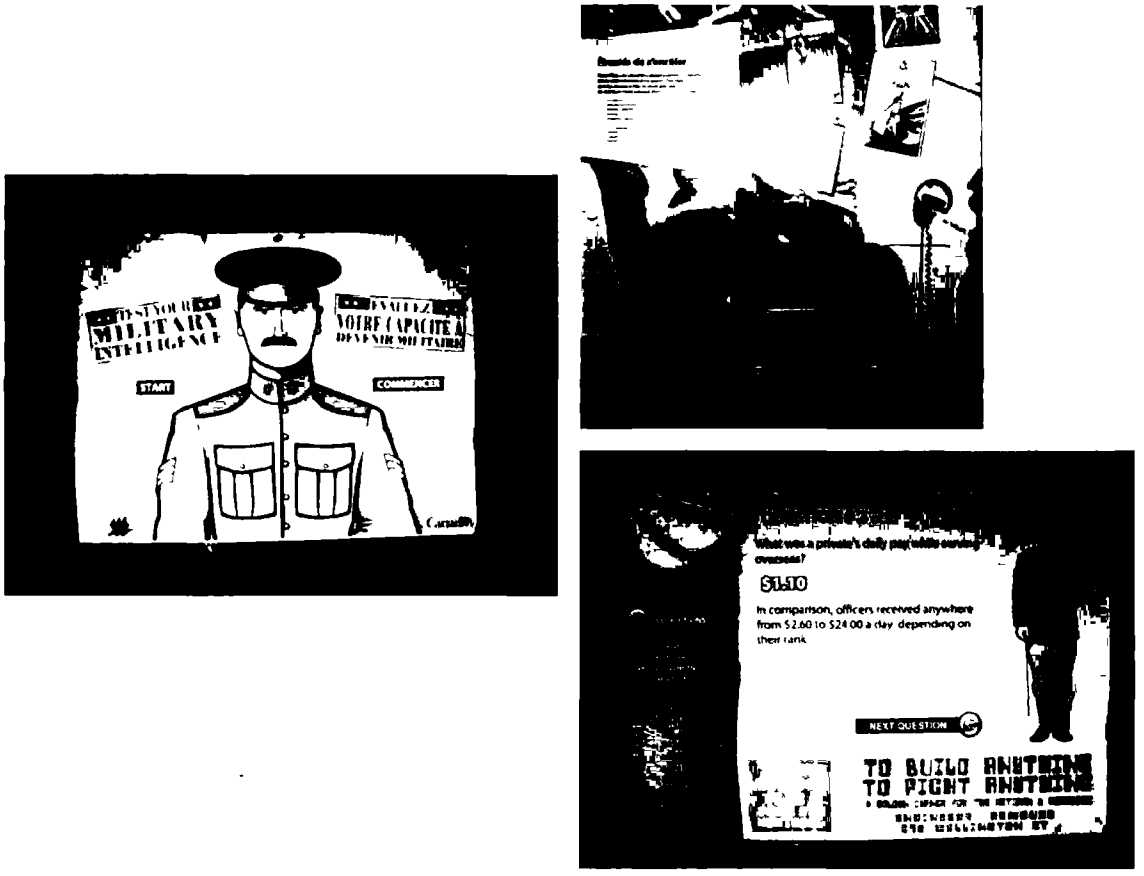

Figure 10 Images of the *Military Intelligence Quiz* interactive game showing both physical setting and touch-screen displays Taken on site at the CWM s permanent exhibition Ottawa (April 16 2010)

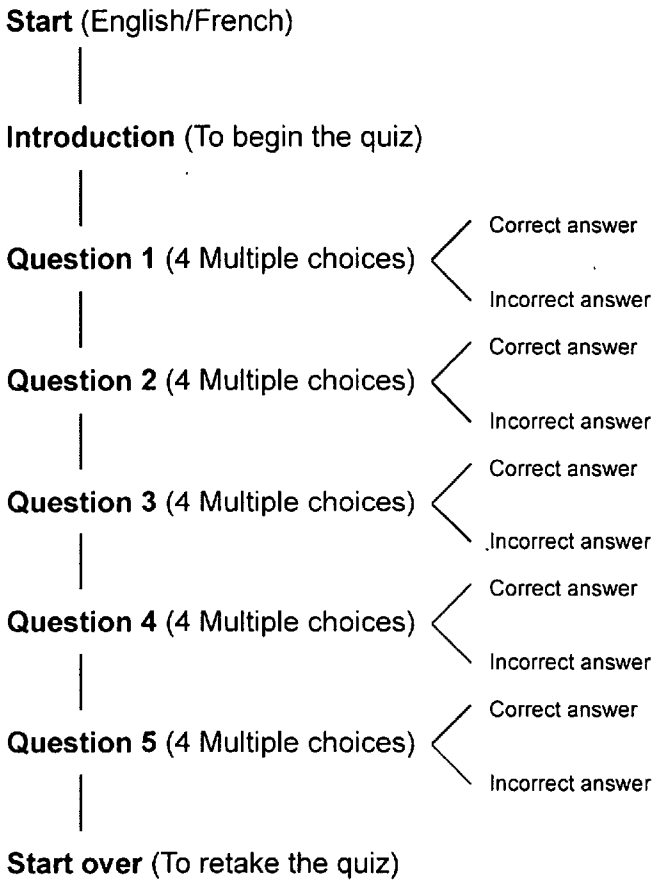

Figure 11. Information architecture of the *Military Intelligence Quiz* interactive game indicates a linear structuring of the messages that has been programmed in the computer interactive unit.

The intent is to impart information about the size and role of the Canadian Expedition Force on the Western Front without flooding the visitors with one information panel after another. The use of a touch-screen computer interactive in a quiz format allows for a conducive and accessible communication of facts and figures. J. Creelman asserts that a quiz seems to be a tried and true way of imparting technical content in an engaging and effective manner. Another advantage of using a computer interactive has to do with the ease of updating and changing content through software.

Sound is introduced in this interactive-game unit because it is appropriate with the idea of a drill sergeant guiding an enlistee through the system The sound of the sergeant barking orders and expressing mild displeasure or satisfaction also gives the visitors a real sense of the scenario. G. Ogden notes that this game style of presentation does not exist in all areas, especially not in the exhibits where the story lines concern the hardship, brutality, and losses of the warfare.

Analysis. By comparing the two interactive units (*Western Europe Deployment Map* and *Military Intelligence Quiz*), it can be proposed that the minimum number of technical components required for an interactive unit is three: PC, touch screen and AV cabinet. The *Western Europe Deployment Map* unit, although it has 17 components, consists of five identical interactive stations with two projectors as additional output channels. The *Military Intelligence Quiz* unit also has one pair of headphones as an additional output channel.

Table 8

Comparison of Technical Components of Interactive Media

	Number of technical components			
Unit	CI	CO/UI	OCI	AC
Western Europe Deployment Map interactive hub 4.C.1 2-NM1	1 (x5)	1 (x5)	2	1 (x5)
The Military Intelligence Quiz interactive game 2.C.1.4-NM1	1	1	1	1

Note. CI = content input, CO = content output; UI = user input; OCI = other content input, AVC = audiovisual cabinet, (x5) indicates the five identical computer-interactive stations that make up the overall interactive hub of *Western Europe Deployment Map*

With the interactive units, the complexity of the content and its messages lies within the structuring of the on-screen information. Since the content is all contained within the PC, the number of technical components does not indicate the complexity of the messages. The information architecture of both units, however, shows different levels of complexity of the content and messages being imparted. The *Military Intelligence Quiz* unit has a linear structure in comparison to the *Western Europe Deployment Map* unit, which contains four main options with layers of breakdowns within each option. For the purposes of this thesis research, the information architecture of the two units will not be further analyzed. Nonetheless, the two units exemplify the capacity of a computer interactive to contain a large volume of complex information and to impart it in a logical and accessible fashion as was also seen in many of the participants' responses from the interviews. The fact that each interactive unit is preprogrammed suggests a predetermined discourse. The information architecture of the content does provide some room for exploration, however it is limited to what has been programmed.

This chapter has recounted in detail all the findings from the three different methods of investigation. To determine how and to what extent the use of design elements affects the conveyance of the exhibition's messages, the next chapter discusses major findings and analyzes them by comparing them from one investigative method to the other.

Discussion

Thus far, there are two levels on which the use of design elements in the CWM's permanent exhibition has been examined in this research On a macro level, the semi-structured interviews of museum professionals have provided many insights into the exhibition development process and the current use of new media and technologies in museum exhibitions Although the previous chapter reports the detailed findings in the order of the interview questions, this chapter discusses the key findings and how they address the issues related to narrative-oriented exhibitions On a micro level, two types of analyses have been employed to specifically look into the presence and effect of design and technological components on the communication of the exhibition's messages The analysis of the AV/NM database is conducted in a quantitative manner, whereas the descriptive visual analysis of selected AV/NM units within the permanent exhibition is qualitative In order to determine the influence of design elements, this chapter helps to coalesce all the findings from the three investigative methods

Semi-structured Interviews

What is the role of design in narrative exhibitions? Despite different opinions about the functions of design in museum exhibitions depending on the participant's role in the process, design mainly serves to facilitate and enhance the communication process between the exhibition and its audiences The findings show that the contribution of design components and techniques to the exhibition's success extends well beyond the typical realm of aesthetics The complexity and demanding scale of creating a museum exhibition entails taking into account physical comfort, content presentation, message communication, and ultimately audiences' experience

In analyzing all of the participant's answers, there are two commonalities design related to the audiences and design related to the exhibition content As a service to the visitors, design provides nonverbal cues (whether aesthetic or not), which serve to immerse them into the exhibition's theme and space Design helps to construct the narrative experience and set the mood More important, design supports and amplifies message delivery by creating a conducive learning environment for the wide audiences As a service to the exhibition content (artifacts, texts, narrative and messages), design helps to protect the collection (through casing and locations), organize the content, embellish the content (within reason), and present alternate

methods of imparting knowledge and information. Although the principal function of design is to make the content readily accessible by translating a cultural/historical interpretation into 3D or other forms, the design purpose can vary depending on the type and intent of the exhibition.

What are the effective design principles and techniques used in communicating information to the audiences in narrative exhibitions? Concerning the current trend towards new media and technologies and its communicative effectiveness, it becomes obvious that each approach or medium has its own benefits. The choice largely depends on the exhibition's objectives and messages. Visual graphics are generally regarded as *tried and true* media in comparison to other new media technologies A common notion among the participants is that technology is not the end goal. The main concern has to do with the appropriateness of the form of communication as it pertains to the subject matter and the target audiences. However, each participant's response shows that it is difficult to articulate the concept of *appropriateness* beyond giving a specific example, as many design choices and considerations in museum exhibitions are often case specific and thus difficult to generalize. This is understandable given the one-off nature of each museum exhibition as well as each participant's disciplinary priorities.

The two main design considerations in developing a museum exhibition are accessibility and communication. The key to accessibility is to make the exhibition, as a product of design, readily accessible to the audiences both physically and thematically, so that they can easily understand and retain the exhibition's messages and content. Accessibility is prioritized over other exhibition elements. The key to communication directly relates to mutual understanding and commitment among its creators (designers, interpretive planners, and curatorial staff) during the development process.

What are the benefits and constraints of the use of design elements in narrative exhibitions? There are design-related limitations in developing an exhibition. The physical design constraints have to do with the characteristics of the space and the exhibition content. The physical aspects of design can limit the visitors' experience and informational access. Limitations on the communicative ability of design relate to: the difficulty in ascertaining how design affects audiences' interpretation and the possibility of unintended outcomes. A potential misrepresentation due to design and the complex nature of creating an exhibition is undeniable

as acknowledged by all of the participants. To address these limitations, museums employ a team approach and stringent approval procedures during the development process.

With regards to the advantages and disadvantages of the use of design elements, the findings suggest that the main consideration is determining the most effective and appropriate option for what is being conveyed to the target audiences. In general, the key advantages of technology integration in museum exhibitions lie in its ability to: (a) simplify, prioritize, and integrate a large volume of information, thus making the exhibition content readily accessible to the audiences; and (b) engage the audiences in interactive ways, promoting their learning and making their experience memorable. However, some recognizable disadvantages include: (a) the cost and complexity of exhibition production and (b) information overload (causing confusion). From the exhibition development point of view, cost, time, and resources required are the main deterrents in using new media and technologies. On a more profound level, there is a tension that arises between the use of technologies and the actual collection–the notion of the reconceptualization of authenticity as previously discussed by Hein (2000) in the Literature Review chapter.

How do museums assess the success (the accuracy and effectiveness of the communication) of their designed exhibition? In theory, there are many evaluative procedures to assess the exhibition's success as well as the accuracy and effectiveness of its message delivery. However, in practice it largely depends more on the available resources: budget, time, and personnel. In the case of the CWM, the performed evaluations also depend on the exhibition scale and are set against the exhibition's initial goals. The exhibition is generally appraised as a whole rather than just a delivery mechanism. Design is included as an aspect of the evaluation. The main challenge is applying what was learned from the results of one exhibition to another because of each exhibition's one-off nature with inconsistent intents and objectives.

Who holds the authority on what gets to be communicated and what visitors experience in an exhibition? The interviews indicate that the authority in communication depends on the organizational structure of each particular museum. However, in general, there are two levels: a higher level of executive committees, and an exhibition level of curatorial staff and other related professionals. Decisions are generally made as a team and through several

approval processes on both levels With narrative-oriented exhibitions in particular, the author of the text has the main authority In the case of the CWM, the historians have written the text and therefore have the authority When dealing with sensitive subjects, stakeholders and the target audiences can be involved to provide direction and reassure the team's decision The CWM used a focus group study conducted by Decima Research Inc Nevertheless, audience involvement again depends on the available budget and time

Given the interdisciplinary nature of exhibition design, is there a way to simplify or streamline the process, and consequently minimize its complexity? As for the possibility of simplifying or streamlining the exhibition development process, the findings suggest two main areas of potential change procedures and designers There needs to be more involvement and communication among team members from various disciplines throughout the entire process Designers, in having to handle interdisciplinary issues, can be trained to have more versatile skills and knowledge

AV/NM Database Analysis

The macro-level analysis illustrates the visual presence of design elements, in the form of AV/NM units, throughout the CWM's permanent exhibition By mapping each unit on the floor plan and indicating the corresponding number of technical components, it becomes apparent that AV/NM units have been strategically placed all along the visitor's path By comparing the 23 themes throughout the four zones of the permanent exhibition (excluding two themes of 4 E and 4 F which the AV/NM database does not have information on) to the 116 identified AV/NM units, there are on average *five* AV/NM units dedicated to each theme This is not taking into consideration the scale and complexity of each AV/NM unit as well as other design elements, such as visual graphics that include 2,000 graphic images and 50,000 square feet of graphic panels (printing) The sheer concentration of design elements suggests the influence or dominance of design components and technology integration on the communication of the exhibition's messages

The micro-level analysis looks at the classification of all the AV/NM units used within the CWM's permanent exhibition, as well as the types of technical components The findings show that despite the complex classification system, the media and technologies used under the

category of AV mainly appeal to the audiences in two ways images and sounds Considering how each component has its own benefits and limitations, they are often used in conjunction to achieve a greater effect The category of NM, which contains various subtypes, is made up of touch-screen computer interactive, the different subtypes really speak to the programmed content and its presentation style, such as games with sound and interactive videos One obvious benefit of using touch-screen computer interactive (the so-called *new media* in the case of the CWM) is the fact that it can integrate visual, auditory, and tactile sensory appeal into one unit In learning that these technical components are the channels through which the content, interpretation, and messages of an exhibition are imparted to the audiences, an answer emerges about how the use of design elements affects the conveyance of the exhibition's messages

Descriptive Visual Analysis

With the descriptive visual analysis, there are two levels of findings physical and informational On the physical level, the findings from all eight selected units suggest that the number of technical components corresponds to the elaborateness of the unit's design, which then reflects the curatorial intent to emphasize the messages This is demonstrated by several of the observed units where the significance of the messages implies more allocation of space and resources and therefore more technical components, especially content output channels as in the case of the *Battle of the Plains of Abraham* unit and the soundscape of the *Trench* reconstruction Hence, the physical complexity of each unit is mostly related to the importance of the messages The messages can be quite simple but the importance of them (which relies on the curatorial appropriation) drives the number and types of components to ensure their conveyance The Museum's choice of including new media and technologies to highlight certain messages indicates that design components and technology integration have a great influence on the communication of the exhibition's messages

On the informational level, the findings show that the number of technical components depends more on the structuring and sequencing of content, which then correlates with the complexity of the subject matter A highly sensitive or controversial issue requires a rather contrived delivery or presentation style This is evident in both the complex dramatization of the *Battle of the Plains of Abraham* story line and the multilayered information architecture of the *Western Europe Deployment Map* interactive unit The amount of information intended

for presentation can also be another influential factor on content structuring and the number of technical components. In the case of the *Human Faces of War: Personal Stories* unit, the complexity of the content, the curatorial intent, as well as the amount of information dictate the choice of media to allow for a complex structuring and sequencing.

In examining all of the selected AV/NM units, visuals and sounds are the key contextualizing elements for the CWM's narrative within the permanent exhibition, which are in addition to texts and artifacts. The use of new media or touch-screen computer interactive offers an additional tactile appeal, integrating several sensory appeals into one unit. With their appeal through sensory channels, these design elements can overpower the actual data or the scholarly research of the interpreted content. The findings, similar to those from the previous database-analysis method, reinforce the impact of design elements on the exhibition's messages.

Synthesis

Comparing the findings from the three investigative methods elucidates how and to what extent design elements influence the communication of the exhibition's messages. From the interview accounts, it is apparent that the exhibition team's use or choice of design elements is largely to enhance and support the communication of the intended messages. Though many participants claim that new media and technologies are not the end goal in their integration, their presence and sensory appeal within the CWM's permanent exhibition are irrefutable. The findings from the AV/NM database analysis support this notion. The mapping of the AV/NM units across all four zones depicts the extensiveness of technology integration in the permanent exhibition. The detailed analysis of the classification of all the AV/NM units and the types of technical components further reiterates the value of new media and technologies, specifically their sensory appeal (visual, auditory, and tactile). By inquiry into the curatorial intention and examination of the designed exhibition in detail, the findings indicate that the importance of the messages dictates the elaborateness of design and the amount of new media and technologies. It suggests that the use of design elements is to reinforce the intended messages. It is therefore plausible to say that from the exhibition creator's perspective, the integration of design and technological components plays a direct and influential role in the way in which the exhibition's messages are conveyed, as shown by the case of the CWM's permanent exhibition.

There are three main ways the findings of this research support notions acquired from the literature review. First, the correlation between the curatorial messages and the integration of new media and technologies supports the idea of museum exhibitions being communicative media. More specifically, it suggests that technology integration is one of many approaches that museums, including the CWM, adopt because of its sensory appeal. Second, although the findings suggest that the degree of technology integration and its influence are at the discretion of the exhibition team, this may not always be the case. It is important to recall that design elements, as technologies of representation, are not neutral and have formative power (Brett, 1996). Within an exhibition, the presence of new media and technologies can overpower the exhibition's messages, known as the pinball effect (Roberts, 1997). Third, the findings from the investigation indicate issues related to the audiences. Several literature sources recommend audience involvement (Hooper-Greenhill, 2004, Fahy, 1999; Weil 2002) to address audience-related issues during exhibition development. The findings also suggest that in order to fully understand how and to what extent design elements affect the communication of the exhibition's messages, the next step is to involve the audiences and look into their interpretation of the curatorial intention.

Conclusion

In conclusion, there are two main insights gained from this research. First, the influence of design elements on the communication of the exhibition's messages largely depends on the curatorial intent and the importance of the messages. This particular finding is mainly supported by the descriptive visual analysis of the eight selected AV/NM units. The *Battle of the Plains of Abraham* theatre experience, for instance, has been strategically designed to contain multiple channels for content and sensory output as well as to provide the audiences with an inviting and comfortable viewing environment. The elaborateness in design clearly indicates a strong curatorial intent to convey the important historical context/foundation of Canada's bilingualism.

Second, despite the implications and debates surrounding the trend towards experience making and sensory approach in museum exhibitions, the CWM's exhibition creators use new media and technologies first and foremost to help the Museum communicate with the audiences. This is shown by the CWM's use of both basic and advanced media as learned from the media database analysis. For example, there are both simple push-button (the *Human Face of War: Personal Stories* audio unit) and sensor (the *Trench Experience* reconstruction) activation systems used throughout the permanent exhibition. The choice of design components and techniques by and large serves to enhance accessibility for the audiences on both physical and informational levels.

From doing this research study, the findings from all three investigative methods confirm that technology integration was not the end goal in developing the CWM's permanent exhibition. Through the investigation of the CWM's technology integration, it is evident that the Museum was conscious of its decision to include each design element. The consistency in both presentation styles and media types best attests to this notion. For the CWM, the use of multimedia and networked technologies is to engage audiences' attention and promote their learning through interactivity and sensory appeal. However, the pervasiveness of new media and technologies across all four zones is irrefutable. This can be seen as: (a) the Museum's succumbing to the popular trend towards experience making through sensory approach, and/or (b) the Museum's attending to the general public's expectations and target audiences' input. Many design choices and technology integration, such as the use of visual, auditory, and tactile components, reflect what was informed by the focus group studies during the front-end stage of the permanent

exhibition's development Most important, the omnipresence of design elements leads to an idea that new media and technologies do play a direct and influential role, as they are the primary channels through which the audiences learn about the subjects on display

One specific advice that can be offered from conducting this research, for designers when dealing with the integration of technology in an exhibition design is to do more research on the basic assumptions and implications related to each technology of representation Designers need to extend their research beyond the components and techniques to materialize the intended experience and communication, they also need to seek to understand the deeper layers (ideologies) of their communicative means This will help ensure the communication effectiveness and more important, the representational accuracy of the exhibition's messages imparted through design and technological components In doing different types of research, exhibition designers also become more conversant communicators, particularly useful in the fields of museum practice and exhibition design where interdisciplinarity prevails

Significance

The investigation of the design and technological impact on the communication of the messages of the CWM's permanent exhibition can potentially contribute to several areas of museum practice as well as design

First, the findings from this research can better inform both designers and museum professionals who work with them in interdisciplinary teams in making design-related decisions while developing new exhibitions or updating existing ones This research has shown both the advantages and the disadvantages of using new media and technologies to enhance the delivery of the exhibition's messages in terms of complexity and resources required For instance, although audiovisual and interactive contents are more attractive than static elements, they often require more time, money, and personnel to develop them

Second, this research particularly provides a better understanding about the elusive properties and values of the exhibition mechanism, especially concerning the use of design elements This is mostly acquired from the interview accounts where the participants discussed the key considerations for technology integration For instance, many participants learn from their professional experiences that imparting information through more than one sense appeals to

wider audiences and promotes audiences' information retention The findings from both the AV/NM database analysis and the descriptive visual analysis also support this idea

Third, partly inspired by the relatively undefined role of the designer in the exhibition development process, this research project also serves to explore the depth of the designer's contribution in an exhibition Many participants express the mutual appreciation and acknowledgement of each member's contribution among the interdisciplinary team The importance of design interventions and the designer's contribution is valued as highly as the curator's and the interpretive planner's This is best shown by the discussion of design being one of the main three elements in the exhibition development process However, the interviews also point towards common challenges within the interdisciplinary collaboration, such as schedule conflict and communication, especially designer's understanding of the curatorial intention Shedding light on the designer's role beyond aspects of aesthetics and accessibility of physical space and information could have implications for educating designers in this field of work Most important, the interdisciplinary and exploratory nature of this research project may also demonstrate how this type of investigative approach might be used to assess the influence of design and technological components in other narrative-driven exhibitions

Limitations

Given the exploratory nature of this thesis research, there are several limitations The first limitation is related to the one-off nature of a museum exhibition and the external validity of the research Time and budgetary constraints limited the researcher's ability to source an exhibition similar enough in both subject matter and approach to make a comparison Nonetheless, this research as a single case study amply allows the researcher to delve into the central and other related issues of this thesis The second limitation concerns the sample size of the interview participants An attempt was made to contact all participants, however, considering the five-year time lapse since the exhibition's opening, the researcher was unable to gain more contacts The third limitation has to do with the research methods The two levels of investigation, macro (semi-structured interviews) and micro (AV/NM database analysis and descriptive visual analysis), create an inherent gap in findings despite the researcher's attempt to use the interview method to bridge the gap Even though the interview questions did provide many insights into the museum exhibition practice and process in general, they could be

elaborated on, into the use of new media and technologies. An altered set of questions may have also helped bridge the gap between the two levels of investigation. The fourth limitation may be due to certain potential biases on the part of the researcher due to previous involvement at the CWM. This has been minimized by: (a) the length of time since the involvement (five years); (b) the use of numerous literary and interview sources; and (c) the research methods selected for this study. Finally, the research project is partly limited by its scope, which only concerns the museum's side of the communication. In order to fully determine the influence of design elements the study could be expanded to also include the audiences and their interpretations.

Recommendations for Future Research

To extend the findings from this research project, there are several recommendations for future research. First, a comparison should be made to another similar exhibition. A potential choice of exhibition for future research would be the Imperial War Museum (IWM) in London, due to its similar content and approach. Second, the researcher could eliminate the macro-level investigation by combining it with the review of literature and theories. This would allow the method of semi-structured interviews to focus more on the micro-level investigation. Finally, to be more conclusive on the design influence on the exhibition's communication, future research should have an expanded scope. More precisely, it needs to address the issue of two-way communication, which is currently beyond the scope of this research. Future research would thus study audiences' interpretations and responses in relation to the use of design and new media and technologies in museum exhibitions.

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Appendix A

Interview Questions

Semi-structured interview questions Museum exhibition design

Background

1 What is your role at the museum?
2 How long have you been working in your position at the museum?
3 Prior to your position here, were you also involved in museum exhibit design?
4 What is your educational background?
5 What attracts you to working in this field?
6 What do you like about working in museum exhibition?
7 What projects are you currently working on?
8 Who do you usually collaborate with in putting together a museum exhibit?
9 What do you like about working in an interdisciplinary team?
10 What are some of the challenges you encounter in working on an interdisciplinary team?
11 Given the new exhibit trend in museums, which focuses on creating experience and technology integration, do you see any advantages/disadvantages?

Opinions on the role of design in museum exhibitions

Given the scope of this project, I'd like to exclude display cases, space layout and lighting So I am focusing on design elements – methods of presentation that are in addition to the object on display and its textual description – which aim to appeal to our sensory and are often in the form of physical interactive, visual graphics, and multimedia applications (sounds, video, and projection)

12 In your opinion, what is the role of design in museum exhibitions? What purpose(s) does it serve?
    a So far, I have identified the purpose or ability of design as being a) to engage the audience b) to represent the subject matter c) to convey the exhibit message, can you think of any other primary purpose of design in museum exhibitions?
    b Is any of these design purposes more important than the other? If so, why?
13 What are the following design elements (methods of presentation) for in museum exhibitions?
    a Physical interactive
    b Visual graphics
    c Multimedia applications sounds, video, and projection
    d Is any of the above more effective in communicating to the audience? If so, how?
14 What are the pros and cons of using these design elements in museum exhibitions (particularly in communicating with the audience)?
15 What are some of the key design considerations in conveying the exhibit message to the audience?
16 Are there ways in which design can limit the communication between the exhibit and its audience?
17 In your opinion, how do design elements used in museum exhibitions influence the audience perception/interpretation of the presented subject?
18 Is it possible that the design elements used in an exhibit could misrepresent the subject at hand?
19 How do museums currently assess the accuracy and effectiveness* of the exhibition in communication?
** The accuracy refers to the differences between exhibitor's original intent of the exhibit message and the final display Whereas the effectiveness refers to whether the design helps promote the audience learning – convey the exhibit message better?*
20 Given the collaborative effort in *re*-presenting a subject in an exhibition, who holds the authority on what gets to be communicated explicitly or implicitly? Does it involve the intended audience?
20 To what extent does an exhibit success depend on its design (particularly the physical interactive, visual graphics, and multimedia applications)?
21 What do you see as some of the challenges in exhibit design that museums face currently or in the near future?
22 In what ways can the museum exhibit design be improved, including its process, principles, techniques, and methods of presentation?

Appendix B

Interview Response Detail Analysis

Participant/ Question	Marc Beck	Daniel Bowin	Lorraine Brown	Sarah Dobbin	Glenn Ogden	Patricia Grimshaw	June Creelman	Total
1 Role	Senior project manager at CMN	Senior exhibit designer at CMN	Interpretive planner at Apropos	Exhibition manager at CWM	Acting manager of programs and interpretations at CWM Senior interpretive planner	Consultant	Director of exhibition and interpretation at Portrait Gallery of Canada	
2 Duration on this position	4 months 1 year as exhibit designer at CMN	2 and a half years	Since 1972	2 and a half years with the corporation (almost 2 years with the CWM)	Since 2002 (8 years working in Interpretation and exhibition development)		1 year and 4 months	
3 Previous experience	Senior exh bit designer at CMN Practice in the US since 1994	Partner at Origin Stud os founded n 1998 (Worked on exhibits for Nat onal Archives and CMC)	Ontario Science Centre	Contract with CMN (for an additional part of their Mammal gallery) Exhibit and tradeshow design and history in theatre	Started in 1998 in the UK Train ng through a museum program n Canada towards a museum exhibition design Various contract positions	Assistant H storian Project Manager in charge of graphics (2004 – 2005) Master of Museum Stud es degree at U of T Other exhibits (Roberts Library)	Interpretive planning consultant for 20 years at Apropos	
4 Educat onal background	BID (1992)	BID (1993)	Undergraduate degree in Bio ogy Master s in Environmental Studies from York University (promoting environmental awareness in informal learn ng environments)	BID (1997)	MA in Modern history from Oxford Univers ty Further postgraduate qualification in Museum Management and Curatorship	BA (Hons) Queen s Univers ty MA War Studies RMC MMSI U of T	Master's in Canadian Stud es BA in History	
5 Attraction to exhibition design	Learning something new for each exhibit The challenge and problem solving involved in conveying the information to a v sitor	Fascination for new knowledge & learning Collaborative working environment	Learning and moving from one top c to another Interest in natural history	Creativ ty involved Insp rational qualit es of museums Teaching and learning aspect	Pass on for public history Ab lity to disseminate my own personal interest in history Connection with 3D artifacts In the case of CWM powerful story ine excellent collection	Ability to use a knowledge of history in a practical sense	Personal interest in history culture communical on with public	
New knowledge and learning	1	1	1	1				4
Personal interest in history/culture			1		1		1	3
Creativity/challenge/problem solving of exhibition	1			1				2
Communication/technology (abil ty to apply and disseminate knowledge in practical ways)				1	1	1	1	4
Change of subject	1		1					2
Collaborat ve work environment		1						1
6 Liking about working in museum exhibition	Learning something new Problem solving Collaborative working process and environment	Process involved (each and every step)	Collaborative working process and environment Contribution from each discipline and creating something better than what could have done ndividually The challenge of reaching people and looking for a better way to convey the message	Collaborative working process and environment	Creativity involved n a museum exhibition development environment The reward ng and challenging experience in realiz ng an exh bition	The look on the visitor s face when his/she sees an exhibit n (watching people learn)	Creative process Ab lity to apply education and interest	
Learning	1							1
Problem solving/creativity	1				1		1	3
Collaborative process and environment	1	1	1	1				4
Interdisciplinarity			1					1
Challenge of creating an exhibition/communication			1		1			2
Visitors reaction						1		1
Ability to apply education and interest							1	1
7 Current project(s)	Live animal exhib t for CMN (Animal um) Earth gallery for CMN	Earth gallery at CMN (permanent exhibition on Earth Sciences)	New water gallery for CMN Master plan for RAM in Edmonton	Maintenance and installations of new projects in permanent galleries of CWM Cyprus Peacekeeping missions exhibition in Zone 4 Exhibition on war and medicine (in partnership with the British Hygiene museum) Traveling exh bition on the history of peace advocacy n Canada	Canada Naval History (web based exhibit on project) The bicentennial of the War of 1812 exhibition (2012) A variety of exhibition projects at any given time going through the process of being developed and approved and mounted	Consultant	New traveling exhibit program for PGC	
8 Key collaborators	Varies with different companies Ideally content developer graph c designer 3D designer and expert (curator/sc entist)	Each museum has a different approach At CMN content developers (writing text selecting images descr bing the intent n terms of illustration materials or other materials that need to be created) exhibit designer project manager researcher At CMC and CWM interpretive planners (no content developers) curator/historian (writing content)	Designer (closest collaboration)	Big group of people (5 10 for smaller exhibitions and up to a hundred people for major ones) Core team project manager exhibition planner historian interpretive planner collections manager Extended team dealing w th programming shipping and loans designer (either in house or hired into the project) executing and installing it	Curatorial staff as principal and immediate collaborators (historians at CWM) Designers in terms of creating an exhibition experience Other people involved project managers collection managers PR staff exhibit preparators	At CWM historians project managers design staff (Origin Stud os Haley Sharpe) collections staff and archival staff	PGC with other museums and galleries (no actual facility) Previous experience designers translators artist project managers architects clients and so on	
Depends on the project/organization	1	1					1	3
Project manager		1		1	1	1	1	5
Collection staff				1	1	1		3
Designers	1	1	1	1	1	1	1	7
Interpreter/content planner	1	1		1				3
Curatorial staff	1	1		1	1	1		5
9 Liking about interdisciplinary team	Teamwork Sharing knowledge & perspectives Co-authorsh p	Teamwork	Teamwork and individual improvement Sharing knowledge & perspectives	Teamwork Sharing knowledge & perspectives Co-authorship Passion and creativity from the team Shared objectives	Sharing objectives knowledge perspectives Passion and creativity from the team to develop an exhibition At a national level museologically speaking it's critical to work n multidisciplinary teams due to the budgets and the scales of the exhibitions	Sharing knowledge & perspectives Ability to glean new ideas from everyone	Sharing and learning new and different perspectives	
Sharing knowledge and perspective	1		1	1	1	1	1	6
Teamwork	1	1	1	1				4
Co authorship and shared objectives	1			1	1			3
Individual improvement			1					1
Passion and creativity of team				1	1			2

10 Challenges with interdisciplinary team	Availability of team members meeting scheduling communication Especially working as consultancy dealing w th approval process	Each individual s professional baggage and deformation If the des gner has the right attitude he or she can be the advocate of the visitor by putting him or herself in a shoe of the visitor and perceiving how the impact of any decisions might actually be The interpretive planner/content developer also acts as an advocate for the visitor by bridging between the basic visitor needs and the exhibition message	Communication between people with different strengths and communication styles Words are abstract used in abstract thinking processes hard to marry the intellectual content with the design content of the exhibit	Egos personality conflicts Organizational challenges process and time	Communication Cross purpose based on communication intents in the exhibitions Various opinions & perspectives on a particular issue Subjection to corporate scrutiny accountability and other pressures (schedule and budget) Carrying ideal/objective forward with the rest of the team	Each individual s agenda" or vision	Use of language (differences in terminology) Differences in working procedure and schedule	
Communication	1		1		1			3
Availability and scheduling	1						1	2
Process/time/budget	1			1	1		1	4
Each disciplinary disposition		1	1		1	1	1	5
Ego/personality conflict				1		1		2
11 Advantages/disadvantages of new exhibition trend	Advantages integrate a lot more content into an exhibit simplify and prioritize information visually and logistically accommodate various learning styles engage visitors in more interactive type ways Disadvantage information overload Key is immersive experience (not necessarily through technology)	In terms of creating experiences one advantage is making the exhibition more conducive to learning In terms of technology the design of exhibition experience is a kind of technology because of hardware and software integration High tech stuff is not an end goal in an exhibition We consider technology only at the service of the story Is it or what is the best vehicle to impart certain knowledge to the visitor?	Advantage seeing the real thing has become even more powerful than it used to be If you can combine seeing the real thing with having some sort of experience then the whole experience become more powerful than either one of them would be on their own It also depends on how old is the visitor what is the visitor looking for and the attitude of the person	Advantage when applied in an appropriate way to meet the need of the users (intergenerational audiences) making it more accessible to them In terms of specific technology more ubiquitous it can be the better Learning style of younger visitors Disadvantage PDA can be a content dump leading people to see the exhibition through the PDA and miss the content If it s an enhancement so that they can see that content at home prepare for the exhibition get more information I think that is really appropriate but it is not ubiquitous to the experience It becomes a separate experience	Advantage variety of approaches and styles to adopt (multimedia multi sensory physical 3D environment with a lot of technology and techniques is one way to communicate) Disadvantage tension between technology and collection (losing the purpose of the message and uniqueness of artifacts by being technology led or being delivery led) Key is to keep objectives in mind in terms of exhibition message audience context and then select an appropriate vehicle for delivering and meeting those objectives Technology more widely available more democratic in a way it operates more usable in an exhibition context than they were The question remains whether we should or not Challenge expectations placed upon museums to deliver via technology	Advantage experiential exhibitions are great if done properly Disadvantage looking cheesy and visitors don t can t get the full idea of what to experience if not done well "too good (being Disney like) can be misleading Technology is only good if it works	Disadvantage losing sight on authenticity (in terms of technology you can get confused between what is real and what is imaginary) Cost and complexity	
Advantages								
More accessible (ability to integrate more content/simplify and prioritize info)	1			1	1			3
Accommodate/conducive to various learning styles	1	1	1	1	1			5
Engage visitors in more interactive ways	1							1
Notion of technology not an end goal	1	1			1	1		4
More powerful experience			1					1
Noted condition properly done				1		1		2
Disadvantages								
Info-overload/content dump	1			1				2
Separate experience				1				1
Tension between technology and collection (losing message purpose and artifact uniqueness)					1		1	2
Confusion						1	1	2
Cost and complexity							1	1
12 Role of design (purposes)	2 definitions of design physical & aesthetic Aesthetic side helps with the mood of the space and immersing the visitors Physical side in organizing the content & space planning	Offers an alternate methods of imparting knowledge or information to a visitor other than through text and traditional methods The use of nonverbal cues to help us understand are crucial in an exhibition (through three use of form colour texture placement location size contrast) To help a visitor understand to help a visitor navigate through a space to orient themselves both physically and thematically	To put the visitor at ease (make the visitor comfortable make them feel welcome make them feel included in the process) So design can take information that could be overwhelming and difficult and make it easy and friendly	Very important to the whole experience The systems for design of museum exhibitions in Canada and US are very different In Canada tendency for the exhibition core team to take tight control over the product where designer is brought on merely to execute these ideas We don t tend to have the time or the budget to prototype some of these ideas so the prototype is essentially the exhibition In US the designers tend to be brought in earlier because the interpretive planners are not within the museums So the contracted design firm does both interpretation and design work as a turnkey operation The role of museums is not to only present this information but to present it in a way that s going to be appealing to the target audience (via design) so that will generate that interest to keep these people coming back	Like the third leg of the three legged stool in terms of creating 3D visitors experience in an exhibition (the other two legs are historical content and interpretation) So design is an equal partner in delivering that experience Ability to transmit objectives and content to the wider public (via effective design) The role of design in terms of approaching our visitors is to deliver the message in accordance with the set objectives The purpose in a functional sense is to translate the interpretive scenario of an exhibition into a concrete 3D world Designers need to be able to work very closely with an interpretive planner	Visitor comfort and way finding (good exhibit design should incorporate seating/rest areas as well as make the exhibit on easy/logical to follow without the visitor having to consult a map every 10 feet)	Multiple purposes to protect the collection to communicate visually to create atmosphere conducive to learning & experiencing	
To deliver a message (communicate and alternate methods of delivery)		1		1	1	1	1	5
To create an experience mood and immersion	1				1		1	3
To make visitors feel comfortable and welcome			1			1	1	3
To help visitors understand navigate and orientate (way finding)		1				1	1	3
To translate interpretation into 3D (organizing content and space planning)	1				1			2
To make info more accessible/appealing	1		1	1		1	1	5
To protect the collections							1	1
To do with the audience	1	1	1	1	1	1	1	7
To do with the content/message	1	1	1	1	1	1	1	7

12a Other purpose/ability	To create the v sitor s experience The aesthetic side helps to enforce that visitor s experience that you want them to have		The design of an exhibit does not really represent the subject matter Maybe it amplifies enhances or elucidates it Even presents" would be better than "represents"	A big technical & logistical role (to make sure that all of the details are taken care of and consistent from hundreds of graphic panels and bits of texts being all consistent produced and insta led properly)	To challenge the assumption on which the exhibition teams been working in certain areas What s important n a full collaboration is to look at the scenarios we created which quite often has design elements in there or may identify design challenges and solve those problems w th us and lead the challenges that we have	The story is primary However if the rest fall by the wayside the story won t be told properly	To keep the objects safe and accessible	
To amplify/enhance/elucidate			1					1
To ensure technical/logistic aspects consistent details				1				1
To challenge the assumption					1			1
12b Any one more important?				The role of a designer here is to help convey that message and to help really inspire the aud ence Conveying the message is the primary responsibility of the interp etive planner and the h storian Designers do play into that It s important that the details do fol ow through	Conveying the exhibit message is f rst because it's a very important communication strategy in a highly complex exhibition The other two become about equal because you want the design to encapsulate all of that		Equally important because they're all integrated	
To convey a message			1	1	1	1		4
Equally important							1	1
Depends on the message and exhibition objective	1	1						2
13a Use of physical interactive	Powerful tool of teaching more visual and tactile visitors a specific subject through means other than reading	Learn ng through play Basica ly they tend to zero in on the kind of visitor who prefers to do as opposed to passively read and look to engage with a particular subject matter Ex To impart an open-ended top c or a question that deserves an exploration then a physical interactive might be the best way to do that.	Primal learning Very basic understanding of physical phenomenon	To show someth ng through texture form we ght Makes it more real and easier to understand things as de from looking	Popular techniques for commun cating a message in creating experiences A different type of experience other than visually For a visitor to interact with something and engage themselves physically with it and reinforce the message mentally It depends on the type of interactive (transmitting informat on simulating experience) At CWM they help communicate certain message Make exhibition experience valuable and memorable From research practice and observation they promote interest social interactions and increase dwell time in the exhibition Challenge there are limitations as well where design helps create successful interactive	In the proper context this can help tell the story or simply engage a visitor who would otherwise walk on past a certa n component of the exhibition	To provide people w th different learning styles ways to engage with the content/subject matter	
To accommodate different learn ng styles other than reading (visual)	1	1	1	1	1		1	6
To communicate certain message					1	1		2
To engage the audience physically		1		1	1	1	1	5
13b Use of visual graphics	To give the first impression and set the mood Immersing the visitor into the content via imagery	Graphics help support whatever messages are being presented n most cases In some cases they can do more they can be featured as the subject matter with no text needed Sometimes t acts as a mood setting device	For visual learners Visual media as primary experience To present something that people have no other way of exper encing P ctures are a strong mediator in an exhib t	To contain all the texts that need to be conveyed to talk about the subject matter with the visitor to help create a tone and an atmosphere and an overall mood and experience for the visitor	Very important visceral communication medium (especially in our bilingual env ronment) Visua cues to emot onal responses factual responses the scale of spectacle Key anchor element in exhibitions to draw visitors nto a situat on to communicate quickly an important message to provide for content exploration (depend ng on the hierarchy and where the images are used) to set the tone and mood and immerse visitors nto the environment Key interpretive tools & medium of record for CWM	Key to capturing the strollers and "streakers" in any exhibition Many people look at the visual material first then the text and artifacts	To provide content in non verba way To help organize and highlight content in the case of text panels (size leg bility)	
To set mood and tone	1	1		1	1		1	5
To immerse visitors into the content draw visitors and set the first impression	1			1	1	1	1	5
To communicate/support a message		1	1	1	1		1	5
For visual learner			1			1		2
Featured as subject matter		1	1	1				3
Medium of record/interpretation			1		1			2
13c Use of multimedia applications	Sounds and project on can be used to set the first impression to create the entire mood of the entire exh b t Video on screen or projection in a theater can provide more information more in depth for people who prefer to be read to or told	They help reach mostly the other things Museums are 90% visual experiences and using multimedia applications help reach the senses in a different way The retention of something expands when you are exposed to it through more than one sense So if you ve seen and heard and touched it you w ll reta n even more Ex a difficult topic to impart requ ring a fa rly structured/linear sequencing of messages to get the point across then an audio/v sual presentation might be used	Can recreate an environment an experience Immersive experience visceral experience can be very powerful But it depends on the type and exhibition	Sounds can be used to create a mood or an atmosphere but also a sort of an audible distinction between sections or to reinforce a cataclysmic event Often integrated with video a picture s worth a thousand words Computer type interactive offers a different way for people to learn about something (more open-ended and inspirational or guiding them to make those connections that they might not)	Give more exposure to content allow us to interpret history in a d fferent way Very useful for creating mood and setting a tone in the space (a sense of discomfort fraction tragedy) Multimedia applications here are also in-gallery new media stations to help interpret a model or a larger artifact where you ll be able to use a touch screen and go in and find out more information and manipulate virtually an artifact as well	Enhance an exhibition but ONLY if they work	It can be for content but often to do with atmosphere and mood To promote deeper level of engagement Soundscape and multimedia can sometimes have lots of content sometimes can be atmospheric Often more emotive than graphics	
To create mood/experience	1		1	1	1		1	5
To provide more information	1			1	1		1	4
To help reach other senses promote learn ng	1	1	1	1	1		1	6
To support interpretation (create audible dist nction/reinforce an event)	1	1		1	1	1	1	6
13d Any one more effective in communicating?		It depends on what is being conveyed Visual graphics inherently not interactive other than evoking reaction or impression their role can be more ubiquitous and secondary In terms of communication it depends on the kind and the amount of information that you re trying to relate	Physical interactives are probably the strongest because they involve the visitor L ke an old saying I hear I forget I see and hear I remember I see hear and do I understand Studies show that visitors are more likely to get it if they are actively involved n the process of discovery	Not necessarily Key is to match what the visitor experience is what they re gonna feel what they re going to understand what they re gonna come away from the exhibition with Visual graphics cost less than physical interactive (from production perspective budgets and timelines)	In a 3D setting multi media applications and visual graphics are more successful in delivering at CWM (more comfort in dealing with in these techniques) Challenge with physical interactives is marrying the intent of the interactive with the actual final execution of it. We prioritize the scholarly robustness of content over some of these physical aspects of them	It depends on the individual Some are visual learners some are tactile learners If one element is out of sync the whole story ne can seem discombobulated All the pieces have to work together to create a successful exhibition	Can t generalize because of so many learning styles in visitors It also depends on the objectives	

Depends on the message the exhibition objective the audience and the kind and amount of information	1	1	1	1	1	1	1	7
Physical interactive			1					1
Challenge to produce PI				1	1			2
Visual graphics				1	1			2
Multimedia					1			1
14 Pros and cons of using these design elements	They all have their own different benefit In an ideal design situation, we typically think of three different ways of presenting each subject matter Key is decide which gives the biggest bang for the buck Ideally you don't do all your exhibits the same way you try to pick and choose which is most beneficial for that subject matter Con the unintended effect/use of physical interactive causing confusion for visitors the cost of production	Con cost Physical interactives and multimedia are very expensive The merging of multimedia and physical interactives where you might have a hands on interactive with a computer readout, to allow for play interaction and exploration as much as possible Key is to determine what is the most effective means of reaching a visitor (impact & entertainment)	Key is to look at visitors and think about visitor's experience for different types of people You have to focus on the overall experience and ensure that there are no clashes Con ensuring that they're put together in a way that they re not going to conflict with each other in the v sitor's experience	Con texts can be overwhelming (the amount of text language level) Pro can add comfort level and level of understanding for the subject Readability accessibility	Pros well selected and conceived use of physical interactive and multimedia can be selling and effective (content selection & communication technique) can be used in combination (powerful visuals, great interactives wonderful vision) Cons challenge in integrating them during design conception challenge in integrating all these products together to have a smooth experience during production copyright issues moral rights of content creators, development time & production process & quality control (2D graphic materials are easier medium for museums to work with) the high expectation of delivered outcome the translation of information due to nature of content	Cons Sometimes design can overpower an exhibition leaving the visitor wondering exactly what they re here to see a museum exhibit or a study on design The design should be invisible, enhancing, but not overwhelming the exhibition	Con sensory overload Pro more enjoyable experience appealing to more diverse group of audience	
Pros								
All with different benefits - key is to determine the most effective for the targeted audience	1	1	1		1		1	5
Accessibility - added comfort level/understanding				1	1		1	3
Cons								
Unintended outcome - confusion/conflict/overwhelming design	1		1	1		1	1	5
Cost/production process/ quality control (Integration during design and production stage)	1	1			1			3
Difficulty in translating info					1			1
To do with the process/cost involved	1	1			1			3
To do with the audience			1	1		1	1	4
15 Key design considerations	Simplicity Clarity Accessibility (physical side heights & locations types of audience legibility) Fun and immersive qualities	Space planning scale mood and ambiance lighting colour palette, materials human interface (graphic panel or touchable artifact or specimen or physical interactive or touch screen), accessibility (inviting and not alienating)	How an exhibit can speak to people A good connection between the textual description and the experience (a close affiliation between the design and the content in order to make an exhibit work well) Key is how people are going to experience it Ex the combination of words and images layout	Access bility (physical accessibility right contrast legibility and text hierarchy) Space layout and flow The appropriateness of the communication (providing not too much but not too little)	Accessibility to the exhibition message and the content (visual physical sensory 3D) Visitors able to access and use the exhibition and be comfortable whilst they re in there An exhibition experience conducive to social interactions and individual visit Accessibility is fundamental to the success of the experience The usability of the space and integrated technologies Another key consideration in conveying the exhibit message is the design team s understanding of the product (in terms of communication and dynamic) which allows that design to be the partner in the process rather than being the executor In Ottawa language accessibility (it changes design) Personally I am less wedded to fabulous aesthetic design ideas than I am to the practicality of communicating to the audience in an effective manner		Accessibility (heights lighting shadow, text font weight) Appropriate/ sensitive to the message (not overwhelming the content) Not letting personal design preference overrule the audience's need/input CWM the amount of content vs space and budget constraints	
Accessibility	1	1		1	1		1	5
Appropriateness (simplicity and clarity)	1			1	1		1	4
Fun and immersive qualities	1	1						2
Communication		1	1	1	1		1	5
Designer's understanding of the intended product					1		1	2
16 Ways design can limit exhibition message communication	The amount of content on the exhibit panel (overload or insufficient) The physical design (angle heights) The layout of the space The grouping and order of information imparted during the exhibition experience	Less is more Key is to strip away stuff that's not required The design or the characteristics of a space (the product of the designer s work in an exhibition) need to serve the story the purpose of conveying mood and message It s a communication medium, if it's speaking in its own term, it's not doing its job It's meant to be a canvas, on which stories are being painted And if the canvas or the frame is too ornate it competes with the story So it needs to be a universal design, in a way, it has to be readily understandable in most contexts it has to be simple and straightforward, not overly laden with details or design	In other words bad design The association (distance or design) between the content and the specimens The cohesion among various types of experiences that you want people to have One thing about CWM is the designed/prescribed path for visitors Key is to think about how do you want people to experience this exhibition, can they follow their own path, will that work?	The accessibility issue (contrast level text sizes reader rails and the angles)	If we get wedded to an aesthetic a structure or a technique, it can interfere with communication Key is to keep that communication intended first and foremost More practically design can get in the way of communicating a message if we don t follow the tried and true steps (going through a deliberate design process and at each level doing all various check-offs according to professional specialism in that process) The lack of quality control or the ability to be flexible and adjust to pressures (schedule, budget or new opportunity) can get in a way of communicating with a visitor The issue of not letting either designer or anybody else rush off with the kind of an idea of what they think a product is and its proprietorial nature of some design work (a close-boxing concept) The integration of the team all the way along the design helps to avoid limiting communication with visitors as well		Design is critical to the exhibition success in terms of visitor's experience It s a way that ideas take physical form so if they're not well thought through they can be barriers	

Amount/organization of info	1	1	1					3
Physical aspects of design elements (height, size)	1			1			1	3
Characteristics of the space	1	1	1	1			1	5
Design development process					1			1
To do with the design of the exhibition	1	1	1	1	1		1	6
To do with the content	1	1	1		1			4
17 Design elements influence on audience	How you immerse the visitor Immersion is a very important word in exhibit design by whichever means It creates a mood that puts the visitor into a space an immersive environment where they can actually experience what they should be learning rather than reading about it by using their imagination and feeling things	If it s well done it should enhance the perception positively and their experience Key is to come up with a design language that supports the messages and also the underlying mood or feelings that are being implied by those messages So all of those things help enhance amplify They act as an amplifier for the message	An opportunity to provide content depth Other elements of a visitor s visit fatigue and various needs Key is to generate an emotional response in visitors and a way of attracting their interests Everything depends so much on the receiver in the exhibit communication	It can either turn them on or turn them right off immediately It depends on the audience If they're presented with something that they can't understand on some fundamental level it's gonna turn them off	Through evaluation processes we learn that at CWM visitors value the authenticity and uniqueness of content and artifacts They tend to put that up higher than say what I'd call a design product The fact that they're getting any messages at all one implication is that design has played a major role in communicating that with them because the space is a 3D deliberately designed space (the opposite is also true) It is an encapsulation of the entire product rather than an attention to a delivery mechanism What we draw from that is the fact that it succeeds So how do they influence? They obviously do and we know from learning style theories as well as practice that certain kind of design techniques can work more effectively than others	Sometimes, a modern or avant garde design can seem out of place in an exhibition on traditional or historical material However that doesn t make it "wrong" It all depends on the purpose of the exhibition Poor design has more influence on an exhibition that good design Poor design can make a museum experience trying and unpleasant Good design is seamless with the rest of the exhibition	It's iterative back and forth between interpretation and design Good communication is necessary because neither would work without the other Juxtaposition of items can create unintended meaning (backdrop images) Size can imply value for something that doesn t have such value Design gives a lot of signals to the visitor about things	
Giving signals that support the message (positive and negative outcome)	1	1			1	1	1	5
Providing content depth			1		1			2
Depends on the receiver and the exhibition purpose (certain techniques more effective)			1	1	1	1		4
Provoking emotional response and interest	1	1	1	1				4
To do with the message/content		1	1	1	1	1	1	6
To do with the audience	1	1	1	1	1			5
18 Misrepresentation due to design elements	Absolutely Hence the need to test certain things on several people Different types of people will experience things differently There s no way to be sure so there s always a chance of it backfiring on you	Yes, very easily That usually happens at the end of the project when you lose sight of your objective Sometimes as you flush out an idea it might lose its efficacy at communicating what it is you were trying to do initially So it can become cumbersome and alienating The result of a natural decay from intent to detail Key is to be mindful of objectives when designing to avoid overly express a particular theme misinterpret a theme The message can feel obtuse and off-putting to a visitor (like speaking with too loud of a voice in a quiet setting) consequently alienating or disinteresting a visitor Visitors walking away is the worst that can happen	It could, but the chances of it happening are quite unlikely	Absolutely Especially in the realm of more ethereal commun cation, you open it up to interpretation Naturally interpreters are going to interpret things and bring their own personal experiences and preferences to things But when you leave it more open to artistic interpretation there is a lot more risk there in terms of people possibly criticizing it	Certainly When it does happen it is a function of the failure of the developmental process and the approval process within an exhibition It can be a communication issue Losing your sight during the process Translating a simple explanation of a complex problem into 3D design world Unexpected/unintended obstructions can be where design elements can misrepresent or more of distort the experience If there's a misrepresent that s an area of development process It can be a function of a very large exhibition project where you can have multiple design teams working to deliver similar products with consistent standards but the way they re interpreted in a particular space by any particular exhibition team can vary (especially with contracts and subcontracts)	Absolutely!	Absolutely and it happens all the time Juxtaposition of items can create unintended meaning (backdrop images) Size can imply value for something that doesn t have such value Design gives a lot of signals to the visitor about things If the designer doesn't understand the value or the intent it can misrepresent the meaning It s very powerful and a lot of people don t read so they just glance and make meanings based on the design Team approach to ensure the message accuracy It s not a straight line process	
Yes	1	1	1	1	1	1	1	7
No			1					1
Unpredictable visitors' interpretation and response	1			1			1	3
Losing sight during the process and iterations		1			1			2
Natural decay from intent to detail		1			1			2
Nature of interpretation				1			1	2
Failure of the development process - communication designers not understanding the intent, multiple teams					1		1	2
19 Current museum exhibition assessment on the exhibition message accuracy and communication effectiveness	At CMN there is a communication team (responsible for communicating to the public so they have different outlook on exhibit stuff) Education department does testing on the floor with the visitors Visitor testing can become frustrating with level of responses Evaluation the exhibit viewed as a tool (the design of the exhibit itself) and see if it works questionnaires	At CMN no design overseeing (mostly political and financial overseeing) CMC and CWM were different The new CWM was a unique situation, a team was created for the purpose of building a new museum There were the right people in the right place (core team as an overseeing committee to review the work from the individual teams) So the work developed its way back up, a formal review done across the board to ensure consistencies and to see if guidelines are needed Very effective but a huge task requiring the work to be looked at it from all the different perspectives (the content, the research the needs/wills of the stakeholders, the need of the visitor) For the design sake, there is no design overseeing There's a common understanding that an exhibit designer will design things that are gonna be robust and functional technically From an aesthetic point of view, there's an understanding that exhibit designers understand their role, which is a supporting role to the messages to the stories that are being told (can be frustrating for designers who want to do mor	Some people do summative evaluations (to measure whether the exhibit has achieved its goals) You can follow people around and see if they are stopping where you want them to stop and experiencing things in the order that you wanted them to experience and then if you got them to it Exit surveys Evaluation is not as much as an active field as it used to be back in the 80s	At CWM study before during and after the exhibition (but not for every single exhibition, usually to reduce the risk of something) Tracking study during the exhibition to see visitor's flow pattern their use of interactives bottlenecks/choke points Sometimes studies are done during and post exhibition to understand if the visitor got the messages and what their experience was like It comes down to time and money	Various types of evaluation process largely depends on resources and time (not equally done for each project but mostly major projects) 400-person survey questionnaire with target groups to assess all the various subjects of the exhibition (communication and visitor experience objectives) There will be questions on how the visitor relate to design elements We usually find out about design elements that don't work rather than the ones that either work ok or work very well There is a personal dimension intrudes on this (unintended positive/negative experience for the visitor) So in terms of the effectiveness of design in promoting the audience learning to convey the exhibition message that will come through as part of that process We have to evaluate everything Some prototyping and design specific evaluation Survey (design is in there but only if it comes out in interpretive scenario or historian intent)	Not sure of the current evaluation Almost impossible to truly know the effectiveness of one s exhibition message When visitors leave did they "get it"? If so, how long will they retain that information? Asking someone on exiting an exhibit if they understood it is one thing asking them if they can recall the information a month later is another	In theory summative evaluations surveys observation tracking, focus groups No real assessment at the end, maybe informal one by the team	

Various types	1	1	1	1	1		1	6
Depends on time/resources/organization	1	1		1	1			4
20 Authority in exhibition message communication	Depends on the museum At CMN most of it is a group decision (the content developer as a head will ask as a group for opinions)	The museum is the author If you're a designer working as a consultant for a museum Within the museum the author can be a different person depending on how the team s structured Essentially the author is the one who has written the text (they are at the root of the success or the failure of the exhibition) Design playing a supporting role in spite of the fact that an exh bition can not exist without designers they re less frowned upon f an exhibition is more or less successful because ultimately it comes down to the content	In most museums a lot of involvement of the staff go ng all the way up to the top of a museum (most museums exhibit planning group which can include both interpretive planners and designers there are milestone documents all the way along that have to be read and approved by everybody)	Generally the historian and the interpretive planner who hold that role Very stringent approval process that goes up through different managerial ranks and right up to the directors and the museum executives as well	The museum (ultimately acting through the director of the exhibition at CWM who gives a final approval after very rigorous approval process) What is strong and successful about our approach is that we form an exhibition team early on in the process who is responsible for the product so there is clear ownersh p and accountability for exhibition products	Depends on the purpose of the exhibition Is it historical/academic? Art based? Artifact based?	The cl ent It depends on the organization Subject matter expert curator	
Depends on the museum/exhibition	1					1	1	3
Higher-level the museum (committee and directors)		1	1	1	1		1	5
Exhibition-level content author (curator/historian/planner)		1	1	1	1	1	1	6
Approval process			1	1	1			3
20a Audience involvement	Yes ideally but it comes down to budget At CMN there are staff who go on the floor and ask questions with visitors about stuff As contractors or design firm you can only do so much based on your exhibit	The aud ence s involved at an arm s length distance at best Formative and summative evaluations surveys and focus group studies are being done with the public to help back the decisions that we ve made or to help us learn from what we ve done (you can walk away from the focus group studies and f nd clarity in things that you might have felt uncertain about) They're surprisingly very useful	It does involve the intended audience to get their feedback on the th ngs to include in terms of exh bition experience So the intended audience can play a role if there s some involvement hence in the end hold some of the authority	Sometimes Most often during the formative stages That is generally when we do our testing (on what exhibition ideas there are and how they re going resonate with visitors) During the development process some internal test ng (asking people here and there but not a lot)	Depends on the project (not in every case) In certain major exhibitions dealing with either new/difficult/sensitive subject matter we will involve audience and stakeholder groups n the exh bition development They can somet mes be the same or different groups of people By involving audience a more powerful and evolved interpretive approach to the exhibition can be developed from their suggestion Schedule budget scale of the exh bition can come into play	It should absolutely involve the intended audience	It does involve the audience in the evaluation If input obtained from formative evaluation they often get used Often it s time or budget constraints	
Depends on the budget and time	1				1		1	3
Formative and/or summative evaluation		1	1	1	1		1	5
Internal testing dur ng the development process	1			1				2
To deal with difficult subject				1	1			2
21 Exhibition success due to design	Extremely important If the exhib t is badly organized it s partially design exercise (end ng up limiting your visitorship) Design helps create some sort of draw (not just aesthetic but all aspects including content It s such a huge beast that requires more than just one person Design s an important part you lose up design you re losing the content	An exhibit on experience is the product of so many things having come together not just design elements but ideas and insights from any member of the team In terms of the interactives an exhibition that lacks interactives (rich media) will exclude an entire segment of the population and can feel static old opaque and ultimately alienating	It depends entirely on the des gn (not only the overal look and feel of the space but also the mix of different media) Kids do want interactive and will gravitate towards computers Design is the whole tell ng element	It can have a very big impact on the success of the exhibition especially if it s one that demands important design elements A show with lots of content is where design can really shine With a larger scale exhibition where we ve got issues of s ghtlines layout text and 3D the exhibit success absolutely depends on design	W th a strongly messaged well-curated exhibition and a thoughtfully well-designed experience it contributes everything Design contributes everything when wedded to a very solid thesis or exhibition scenarios to begin with Visual graphics are important and widely used If interactives and multimed a are a central experience where at the heart of an experience is the ability to communicate then design is cr tical Sometimes they are just tangential then not critical to the interpretation	It involves visito comfort If an exhibition content is superb but the des gn is flawed (i e bad lighting poor graphics no rest areas lack of way finding etc) the experience will not be a good one Likewise if the des gn is great but the content is lacking the v s tor w ll be disappointed There needs to be balance between content and design	It depends a lot The best content or storyline is rare y successful at communicat ng without a good design (not necessar ly requires a use of physical interactive or multimedia) If the object is intrinsically interesting and important des gn is less important	
Cr tical	1		1	1	1		1	5
Interdependence between design and content (exhibition scale and complexity)	1	1	1	1	1	1	1	7
Association of design to physical interactive		1	1		1			3
22 Current challenges for museum exhibition design	The biggest one is the amount of money they have for the exhibits (all the cuts that from the government and the fact that a lot of museums gone on strike) Finding a replacement for that money there are rather more successful museums in the States you ll find they have a lot more money for an exh bit	Funding The budgetary time and resource constraints make it difficult to compete with other attractions Vis tor's high expectation of technology integration in museums Designers cannot develop such sophisticated product in a gallery sett ng (little prototyping a lot of educated fath n the device that we come up with) With n a very t ght set of constraints we have to come up with something that w ll compete with very high budget product on happening elsewhere in the world	The problem of money With budget cuts it can be easy to lose a good plan (as you eliminate you fracture the plan) Exh bit designers have to be ready to turn on a dime change directions rethink the idea and respond to econom c cha lenges that we have On the other hand technology has made it easier in a way to design a good exhibit (but that still depends on money)	Competition from other information sources (television movies internet) People are getting really busy An expectation on the use of technology to help impart information (challenges timelines prototyping budgets human resources) The content to be used with technology often needs to be much richer than we have the human resources to deal with Copyright issue (images and sounds can take time and money to find and to integrate)	In terms of process choosing a designer partner (who understands the culture and objectives of the inst tution) contracting different design firms thus inconsistency in design working with newer design companies (who are not fam liar with our institution) hence investing a lot of t me in creating that relationsh p The process of communication and education between design and a museum Democracy and accountability in an exhibition (audience vs interpretation voice) Visitor's expectation for technology integration in exh bition Visitor focus issues when using technology in interactive Competition with other forms of entertainment Change in visitorship and design implications (how does it reflect the audience that we serve) The idea and prevalence of museums without material culture (relying on interactives or virtual/audio/visual experiences to communicate messages) Technology integration in a practical way for vis tors to experience the exhibition (using their own device)	Greater demand for accessibility (which can make certain aspects tricky) Keeping up with technology advancement (finding funds to update technology)	Publ c institutions not able to keep up with private sectors n terms of technology Not able to compete replace what s used in the exhibition as often Chang ng ways of consuming information Generational change Meeting increas ngly diverse audience and expectations	
Funding	1	1	1	1		1		5
Time and resource constraints		1		1	1	1		4
Visitors expectation		1		1	1	1		4
Competition with private sector		1		1	1	1	1	5
Designers (adaptability/understanding)			1		1			2
Competition with other forms of entertainment				1	1			2

Changes in audience (type/consuming pattern)				1	1		1	3
To do with the technology		1		1	1	1	1	5
To do with the audience		1		1	1	1	1	5
To do with the museum as institution	1	1	1	1	1	1	1	7
To do with the exhibition design (process/ designer)		1	1	1	1	1		5
23 Ways to improve museum exhibition design	Having your key team members involved from beginning to the end of the exhibit (content 3D/2D design research and experts involved to create the interpretive plan the concept to develop the design and the entire exhibit as a team) Thinking of where to find additional funds (a person on the team be responsible for fundraising hit harder on getting more private funding and sponsorship for the specific subject)	Having someone on the team who can bridge (or a lot of interaction) between 3D and 2D to ensure of true integration of the two disciplines We have all the tools that we need in terms of technology Role of designer expanding beyond traditional realm (multimedia interface web design due to the quantity of the multimedia products in the gallery) Ability to talk in terms other than your own when you're dealing with consultants (the less you know the more you're gonna rely on their good faith to help you out)	Communication flexibility and collaboration within the team The designer needs to listen be open-minded learn how to be iterative in their thinking throughout the process The process is hard to pin down because it's different on every project	Always room to improve on the process and techniques (progression on best practices as technology changes) Learning styles and visitor's needs More time and money to develop an exhibition (instilling those values in the organization to allow for more prototyping) Flexibility of a small organization but the power of a big organization	Designers to understand the museums as cultural institutions and museums (how museums operate their core functions types of people they interact with language of communication) to make them museum ready Process principles the devil is always in the detail so more of a commitment to a very clear process (understanding the responsibility on either sides of the fence or within the team) The principle of the collaboration in a very defined development process is key and has been done Communication techniques to help getting value out of design teams (communication is absolutely critical process is absolutely critical in a multidisciplinary team where people are offsite) As for methods of presentation it's really about what suits the client what I need done Commitment to working between design and a museum that is key to everything (intent motivation connection to the project)	Collaboration between exhibition team members and design members is key Each has his/her own view on what the exhibit should look/feel like But each has to be willing to compromise and listen to others Key is to think always like a visitor and keep the visitor's comfort in mind They are the ones keeping the lights on It doesn't matter what you think about how an exhibition should be presented if the visitor is going to be uncomfortable and not enjoy the experience We're doing this for them!	More formal training in exhibition design More cross-pollination between interpretation and design	
To do with the development process and design team	1	1	1	1	1	1		6
To do with the designer		1	1		1		1	4
To do with the museum as organization	1			1				2
To do with the interdisciplinary nature of exhibition			1		1	1	1	4

Appendix C

List of Selected AV/NM Units for Visual Descriptive Analysis

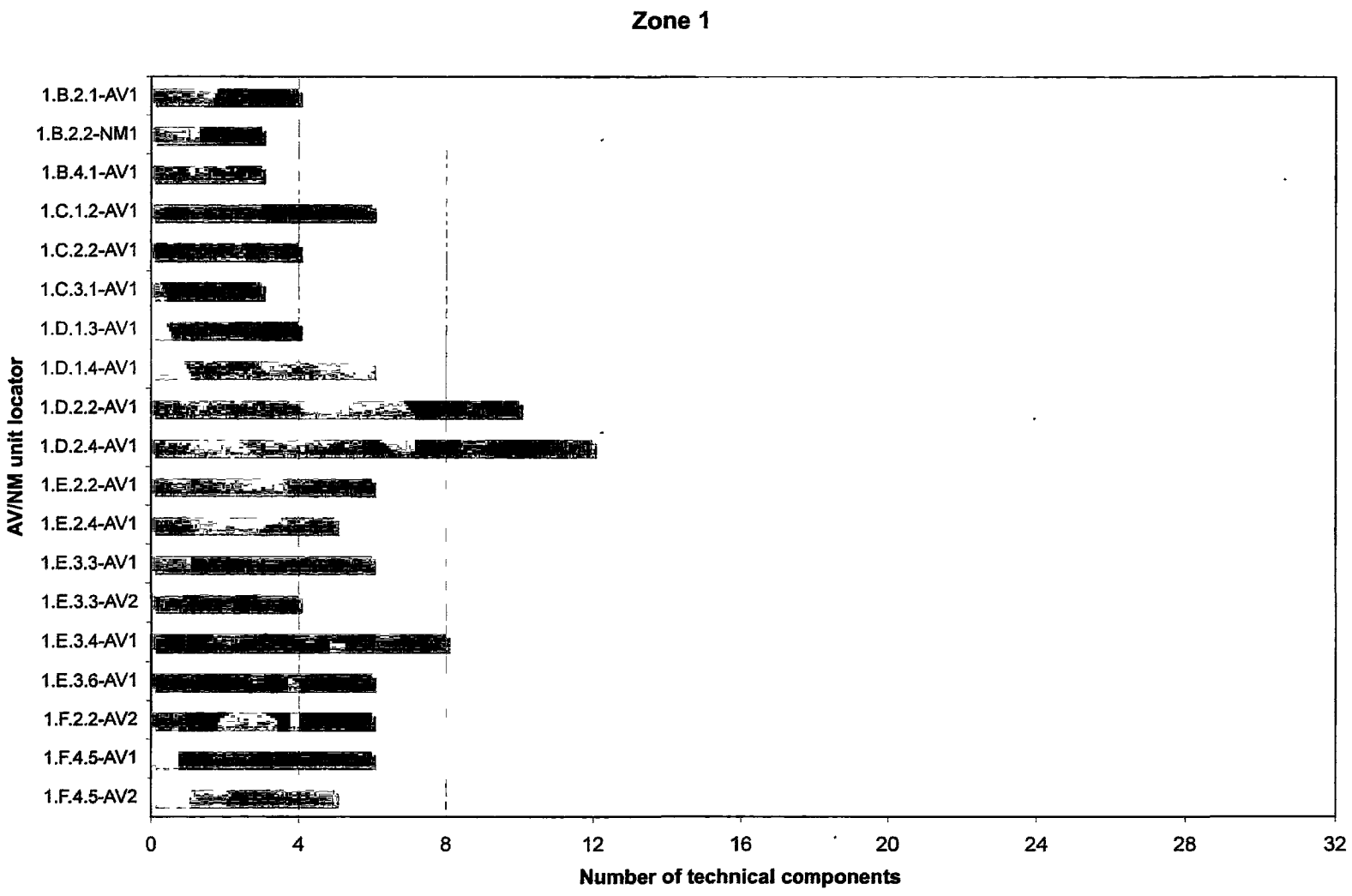
AV Sub-type	***First Choice***	***Alternative***
	– Title (Technical components #)	
Audio (high)	● 2 F 3 1-AV1 – Human Face of War Personal Stories (15)	4 C 2 1-AV2 – Oral Accounts from Families Abroad (10)
Audio (low)	● 2 D 1 6-AV2 – Trench Experience Field Telephone (3)	4 B 3 1-AV2 – Drill Instructor (3)
AV (high)	4 C 7 4-AV1 – The Story of Peacekeeping (31)	● 1 D 2 4-AV1 – The Battle of the Plains of Abraham and Its Consequences (12)
AV (low)	● 1 D 2 2-AV1 – Battle lines (10)	● 2 C 3 2-AV1 – Canadian Woman Reacts to Shock of War (4)
Soundscape	● 2 D 1 6-AV1 – Trench Experience (8)	3 C 2 2-AV1 – Streetscapes (7)
Video	4 C 6 3-AV1 – Nuclear Blast Effects Footage (8)	3 F 1 2-AV1 – Liberating the NL (6)
NM Sub-type		
Game	● 3 B 4 9-NM1 – Break the Code (3)	4 C 5 3-NM1 – Pilot Training Written Test (3)
Game with sound	● 2 C 1 4-NM1 – Military Mysteries Quiz Interactive (4)	4 C 4 3-NM1 – Sonar Computer Simulation (4)
Interactive Video (high)	● 4 C 1 2-NM1 – Western Europe 'Big Board' Deployment Map (17)	N/A
Interactive Video (low)	3 E 7 8-NM1 – Snooping Around the Sherman Tank (3)	● 1 B 2 2-NM1 – Military Roles in Peace Time (3)

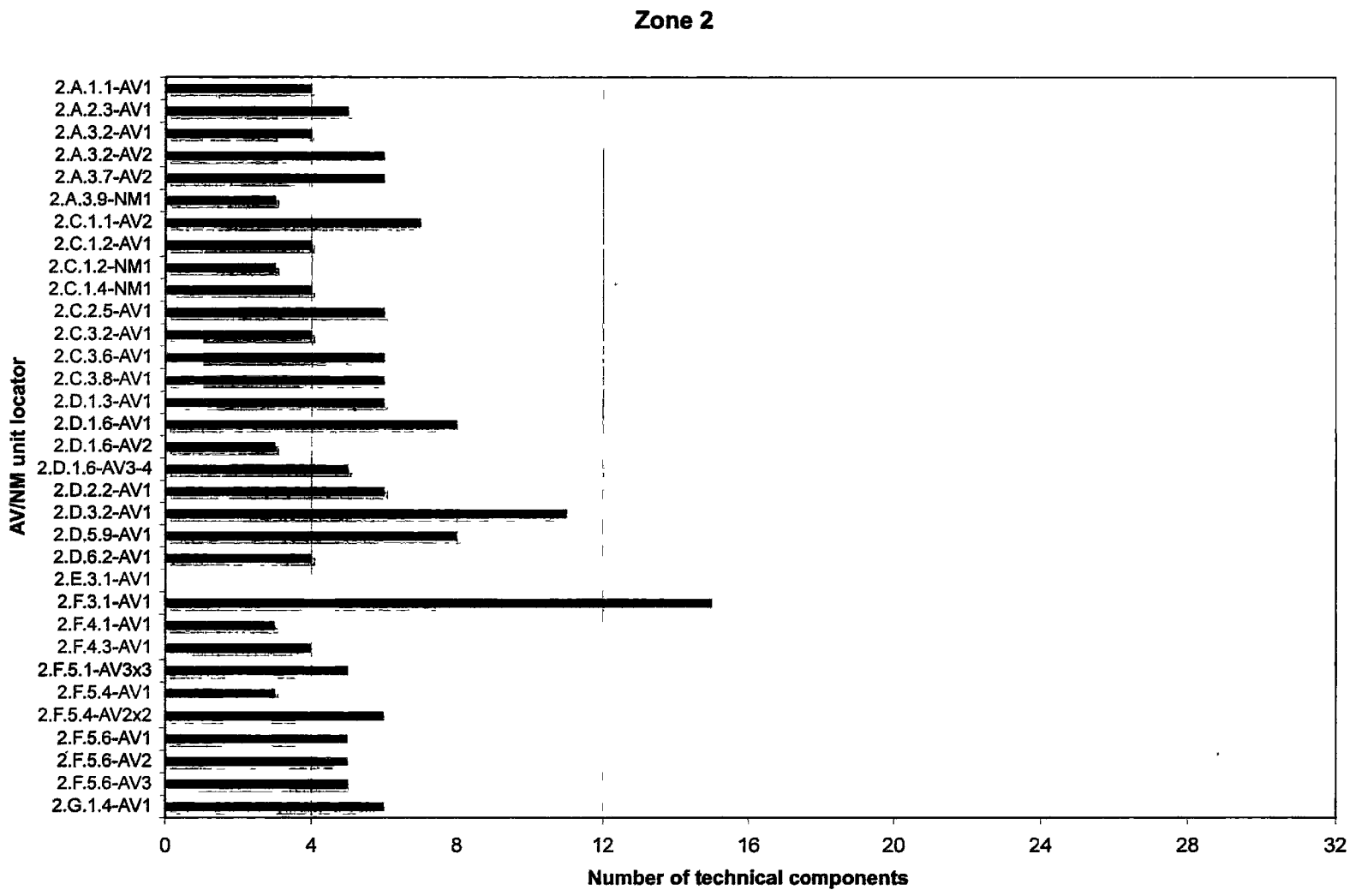
● G Ogden s input

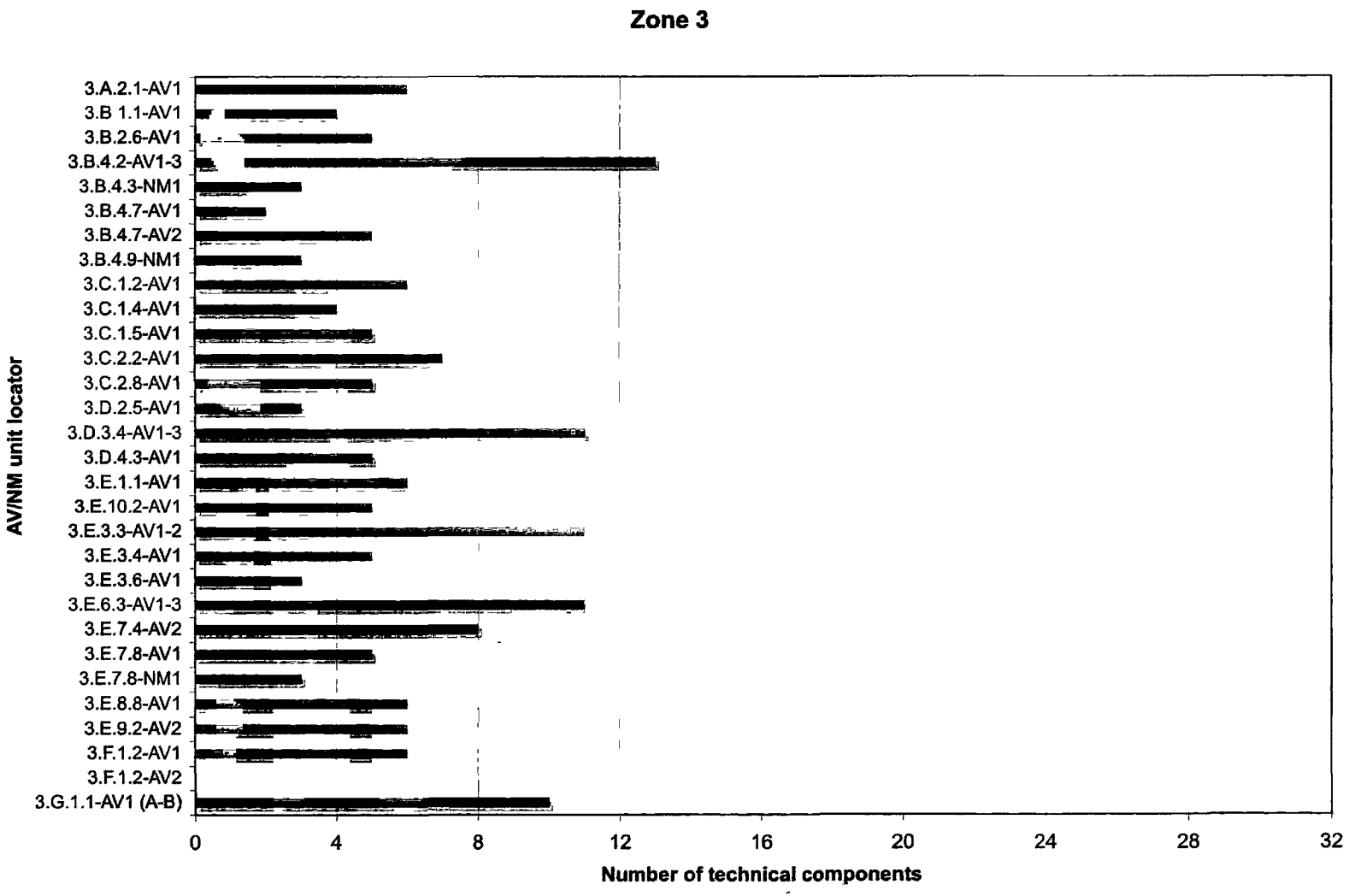
J Creelman s input

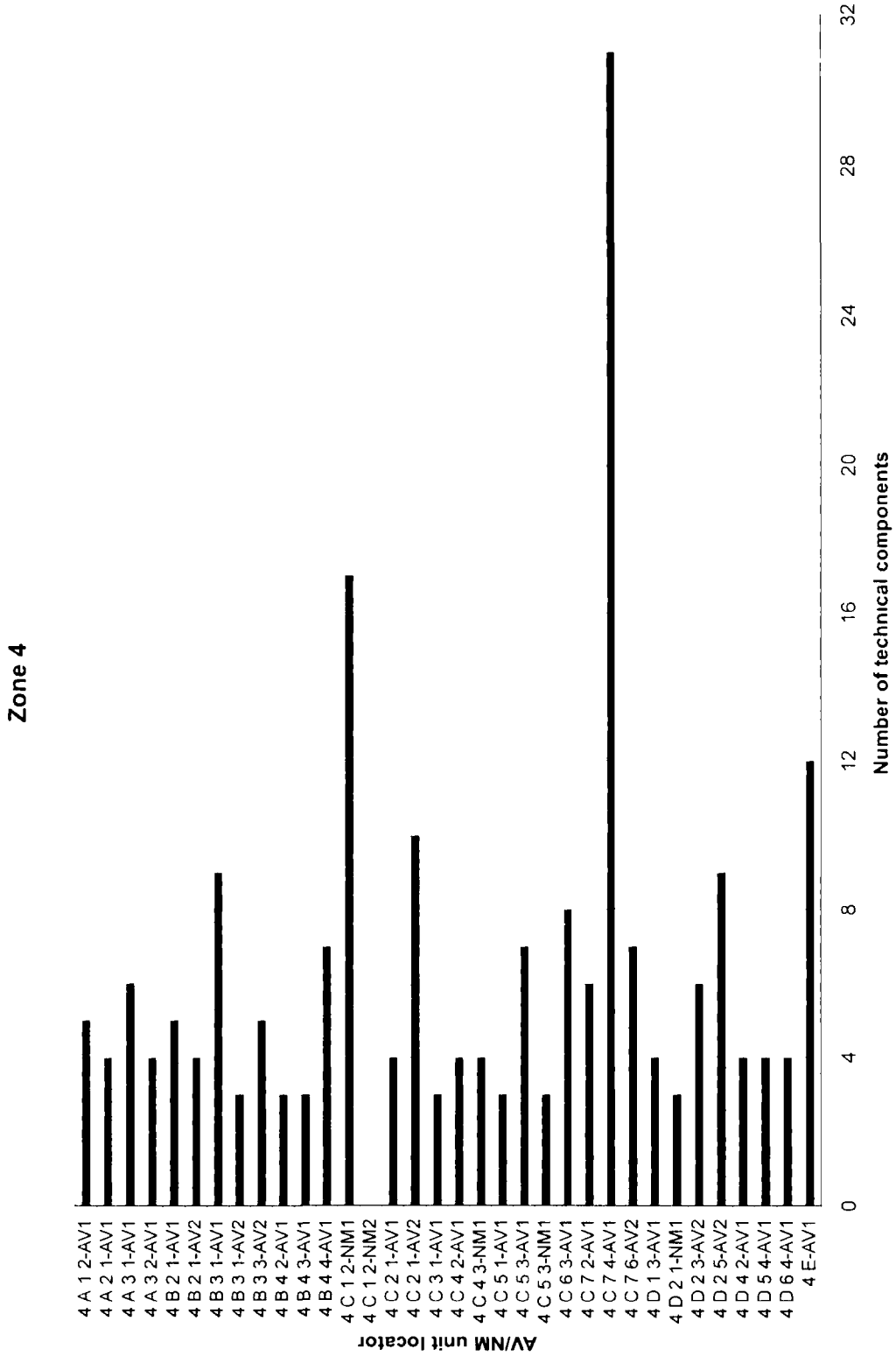
Appendix D

Comparison by Zone of Each AV/NM Unit's Total Number of Technical Components




Zone 2
AV/NM unit locator
2.A.1.1-AV1
2.A.2.3-AV1
2.A.3.2-AV1
2.A.3.2-AV2
2.A.3.7-AV2
2.A.3.9-NM1
2.C.1.1-AV2
2.C.1.2-AV1
2.C.1.2-NM1
2.C.1.4-NM1
2.C.2.5-AV1
2.C.3.2-AV1
2.C.3.6-AV1
2.C.3.8-AV1
2.D.1.3-AV1
2.D.1.6-AV1
2.D.1.6-AV2
2.D.1.6-AV3-4
2.D.2.2-AV1
2.D.3.2-AV1
2.D.5.9-AV1
2.D.6.2-AV1
2.E.3.1-AV1
2.F.3.1-AV1
2.F.4.1-AV1
2.F.4.3-AV1
2.F.5.1-AV3x3
2.F.5.4-AV1
2.F.5.4-AV2x2
2.F.5.6-AV1
2.F.5.6-AV2
2.F.5.6-AV3
2.G.1.4-AV1
0
4
8
12
16
20
24
28
32
Number of technical components

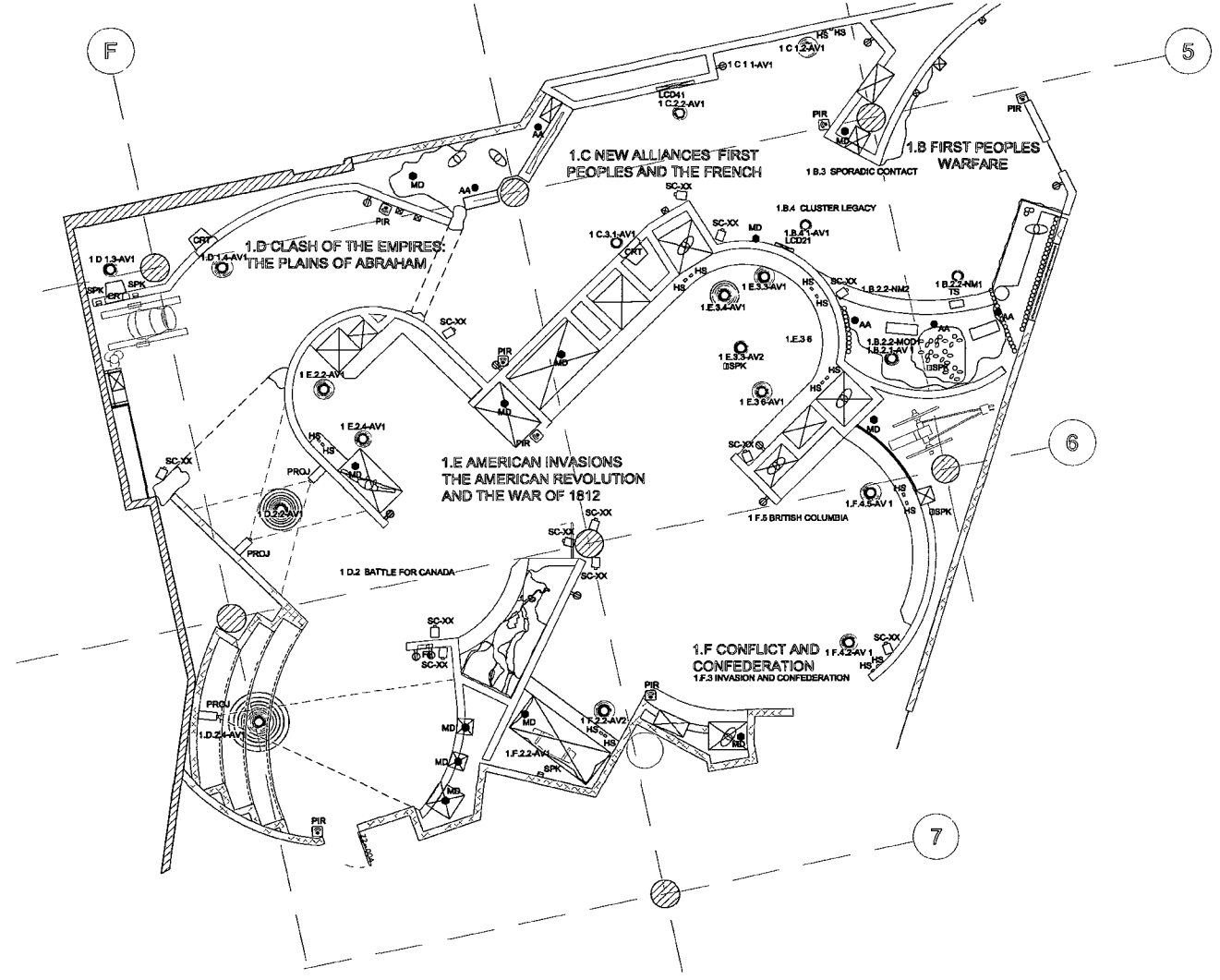

Zone 3
AV/NM unit locator
3.A.2.1-AV1
3.B 1.1-AV1
3.B.2.6-AV1
3.B.4.2-AV1-3
3.B.4.3-NM1
3.B.4.7-AV1
3.B.4.7-AV2
3.B.4.9-NM1
3.C.1.2-AV1
3.C.1.4-AV1
3.C.1.5-AV1
3.C.2.2-AV1
3.C.2.8-AV1
3.D.2.5-AV1
3.D.3.4-AV1-3
3.D.4.3-AV1
3.E.1.1-AV1
3.E.10.2-AV1
3.E.3.3-AV1-2
3.E.3.4-AV1
3.E.3.6-AV1
3.E.6.3-AV1-3
3.E.7.4-AV2
3.E.7.8-AV1
3.E.7.8-NM1
3.E.8.8-AV1
3.E.9.2-AV2
3.F.1.2-AV1
3.F.1.2-AV2
3.G.1.1-AV1 (A-B)
0
4
8
12
16
20
24
28
32
Number of technical components


Zone 4
AV/NM unit locator
4 A 1 2-AV1
4 A 2 1-AV1
4 A 3 1-AV1
4 A 3 2-AV1
4 B 2 1-AV1
4 B 2 1-AV2
4 B 3 1-AV1
4 B 3 1-AV2
4 B 3 3-AV2
4 B 4 2-AV1
4 B 4 3-AV1
4 B 4 4-AV1
4 C 1 2-NM1
4 C 1 2-NM2
4 C 2 1-AV1
4 C 2 1-AV2
4 C 3 1-AV1
4 C 4 2-AV1
4 C 4 3-NM1
4 C 5 1-AV1
4 C 5 3-AV1
4 C 5 3-NM1
4 C 6 3-AV1
4 C 7 2-AV1
4 C 7 4-AV1
4 C 7 6-AV2
4 D 1 3-AV1
4 D 2 1-NM1
4 D 2 3-AV2
4 D 2 5-AV2
4 D 4 2-AV1
4 D 5 4-AV1
4 D 6 4-AV1
4 E-AV1
0
4
8
12
16
20
24
28
32
Number of technical components

Appendix E

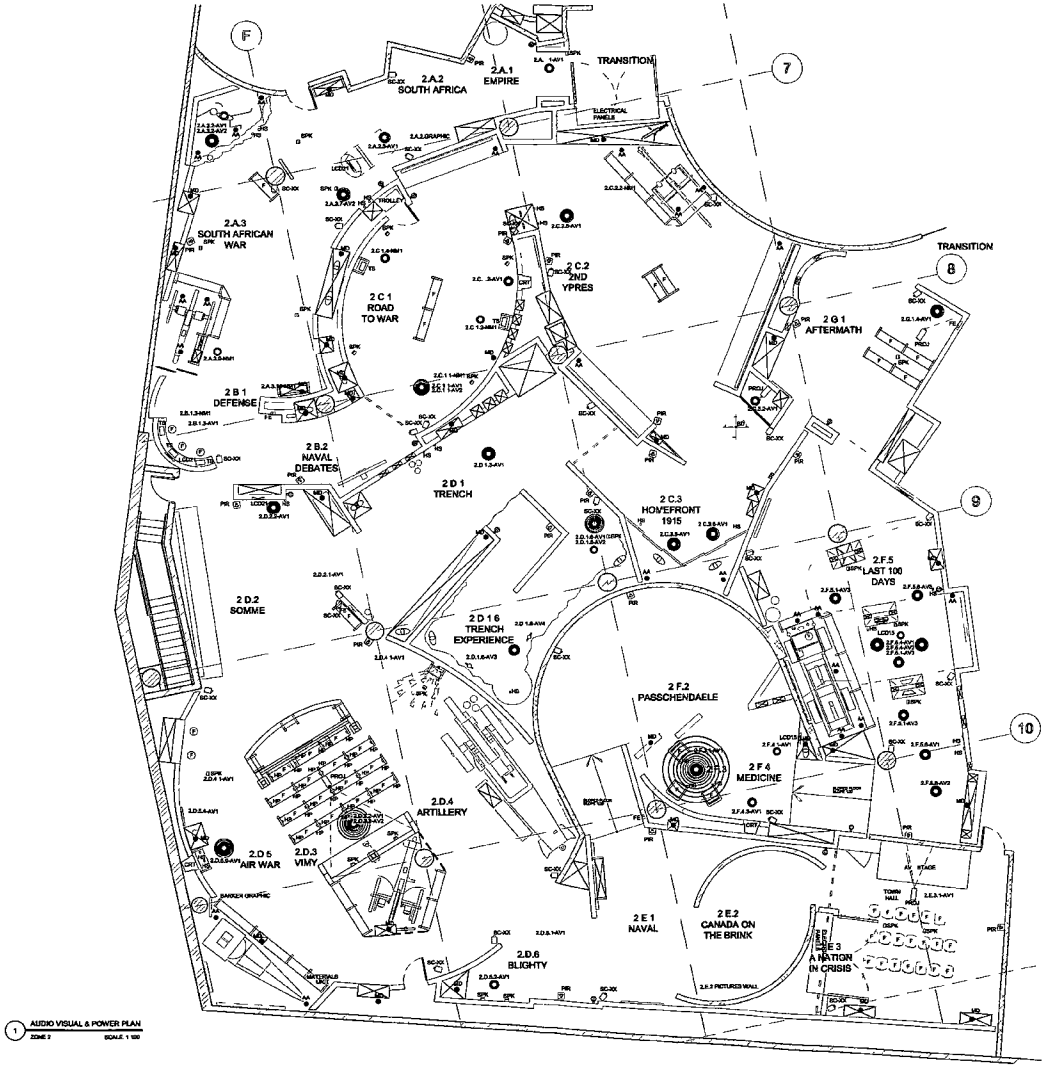
AV/NM Unit Location by Zone with Technical-Component Number Indicator

Zone 1

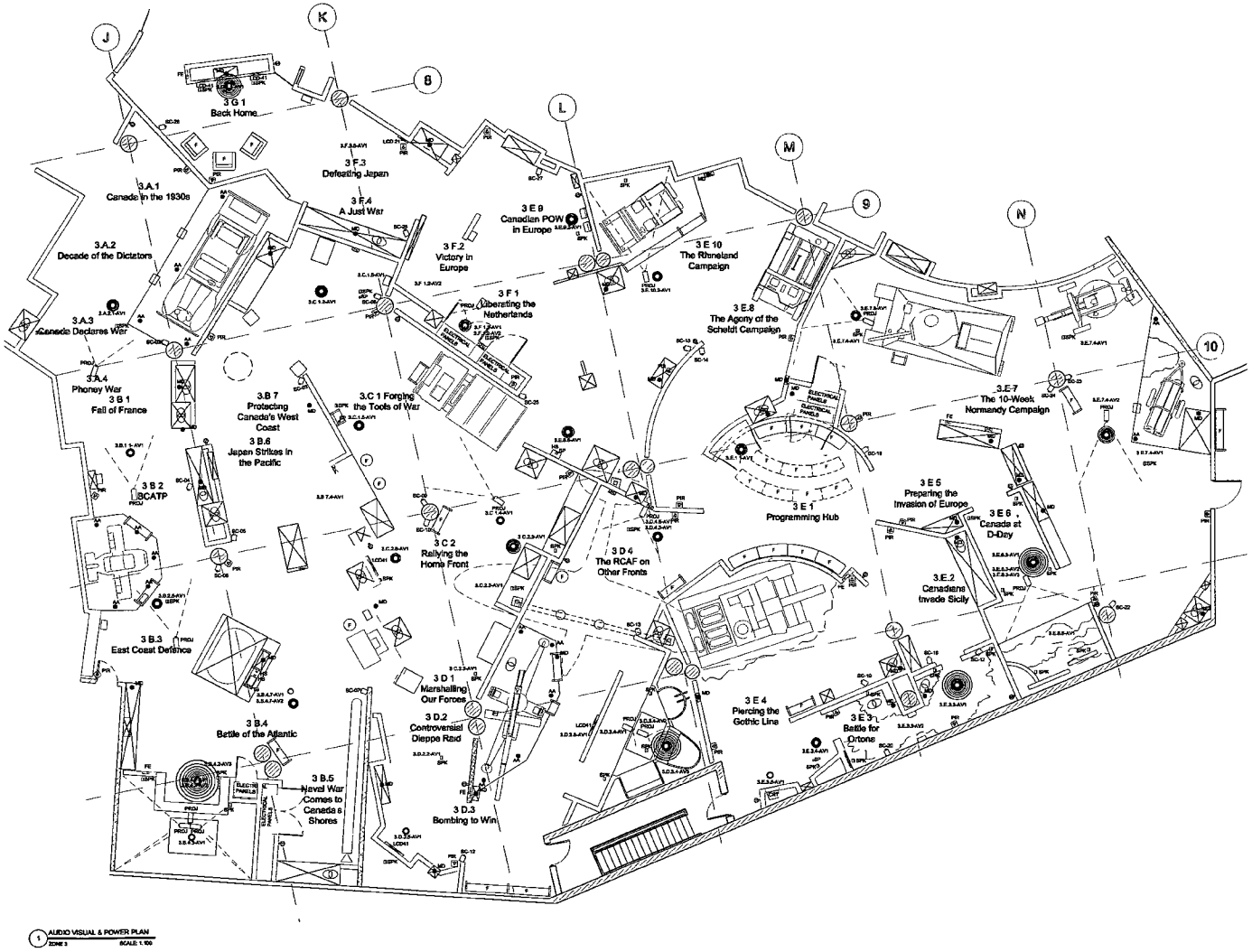


1 AUDIO VISUAL & POWER PLAN
ZONE 1 SCALE. 1 100

Zone 2

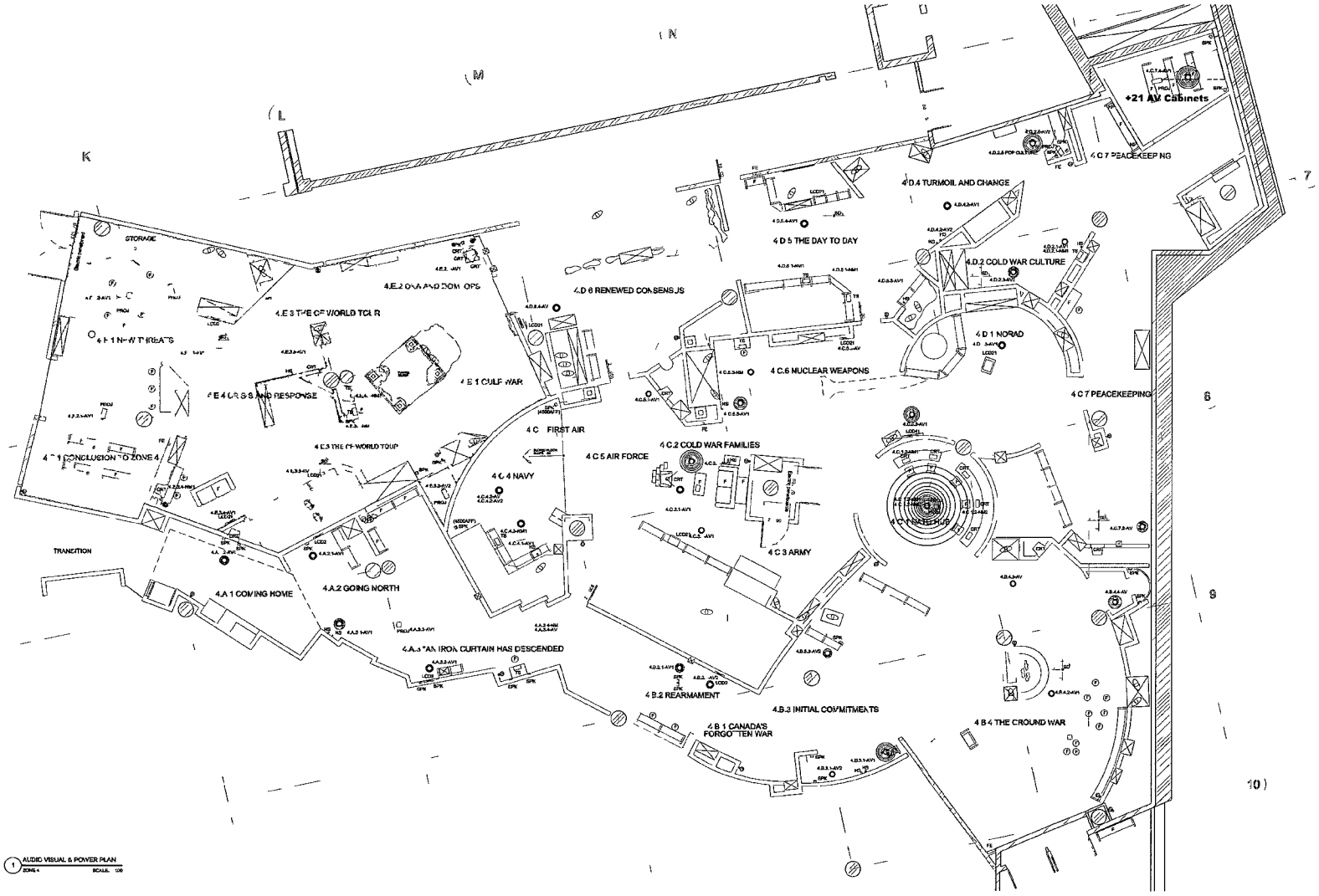

F
7
8
9
10
TRANSITION
2.A.1
EMPIRE
2.A.2
SOUTH AFRICA
2.A.3
SOUTH AFRICAN
WAR
2 C 1
ROAD
TO WAR
2 C.2
2ND
YPRES
2 G 1
AFTERMATH
2 B 1
DEFENSE
2 B.2
NAVAL
DEBATES
2 D 1
TRENCH
2 C.3
HOMEFRONT
1915
2 F.5
LAST 100
DAYS
2 D.2
SOMME
2 D 16
TRENCH
EXPERIENCE
2 F.2
PASSCHENDAELE
2 F 4
MEDICINE
2.D.4
ARTILLERY
2.D.5
AIR WAR
2.D.3
VIMY
2 E 1
NAVAL
2 E.2
CANADA ON
THE BRINK
2 E 3
A NATION
IN CRISIS
2.D.6
BLIGHTY
AUDIO VISUAL & POWER PLAN

Zone 3



1 AUDIO VISUAL & POWER PLAN
ZONE 3 SCALE 1:100

Zone 4


+21 AV Cabinets
4.D.4 TURMOIL AND CHANGE
4.D.5 THE DAY TO DAY
4.D.2 COLD WAR CULTURE
4.D.6 RENEWED CONSENSUS
4.D.1 NORAD
4.C.6 NUCLEAR WEAPONS
4.C.7 PEACEKEEPING
4.E.1 GULF WAR
4.C FIRST AIR
4.C.5 AIR FORCE
4.C.2 COLD WAR FAMILIES
4.C.4 NAVY
4.C.3 ARMY
4.A.1 COMING HOME
4.A.2 GOING NORTH
4.B.2 REARMAMENT
4.B.1 CANADA'S FORGOTTEN WAR
4.B.4 THE CROUND WAR
TRANSITION
STORAGE
AUDIO VISUAL & POWER PLAN

Appendix F

Interview-Response Brief Summary

Interview questions and responses	No. of responses
1. Personal perspective on exhibition development	
Initial attraction to working in museum exhibitions	
Passion for learning and acquiring new knowledge	7
Desire to apply and disseminate knowledge in a practical way	4
Interdisciplinary aspect of museum exhibitions	
Varying team members depending on the museum	7
Sharing knowledge and perspectives is rewarding	6
Challenges within the interdisciplinary work process	
Communication	4
Each member's availability (schedule conflict)	3
Each member's disciplinary disposition (priorities and work process)	5
Views on the trend towards experience making	
Accommodating various learning styles	5
Technology integration not being an end goal	4
Risks concerning collections' authenticity and exhibitions' message	2
2. Role of design in museum exhibitions	
Purpose of design	
Conveying the exhibition's message	4
Design playing a supporting role	2
Benefits and weaknesses of different design elements	
Physical interactive	
Accommodating different learning styles	6
Physically engaging the audiences	5
Making audiences' experience memorable and readily comprehensible	2
Visual graphics	
Communicating and/or supporting the messages	5
Immersing audiences through tone and mood setting - 5	5
Drawing audiences' attention by giving the first impression - 5	5
Multimedia applications	
Stimulating other senses in communicating the messages	6
Presenting information in an engaging and intuitive fashion	6
Communication effectiveness of each design element	
Depending on exhibitions' messages, audiences, and information	7

Interview questions and responses	No. of responses
Disadvantages with the use of design elements	
Issue of unintended outcomes	5
Costs and resources required for production and quality control	3
Key design considerations in the exhibition development process	
Communication	5
Making appropriate design choices to enhance the messages	4
Ensuring the simplicity and clarity of the content	2
Maintaining the immersive and entertaining qualities of the exhibition	2
Issue of communication effectiveness within the design team	2
Accessibility	5
Design limiting audiences' physical and informational access	6
Exhibition content (amount and organization of information)	4
Potential influence on the audiences and misrepresentation	
Direct influence on audiences' interpretations	7
Depending on the exhibition's purpose and target audiences	4
Giving signals in the exhibition setting while supporting the messages	5
Eliciting emotional response(s) and interest from the audiences	4
Potential misrepresentation of the subject matters and messages	6
Team approach and approval process involved	2
Misrepresentation due to audiences' unexpected response	3
Other potential causes of misrepresentation in museum exhibitions	
Natural decay from conception to materialization	2
Inherently subjective nature of interpretation	2
Losing sight of original intent during review process and design iterations	2
Failure in communication among the interdisciplinary team members	2
Current assessment of the exhibition's communication	
Various assessments (front-end, formative, and summative evaluations)•	6
Depending on time, resources (budget and personnel), and the institution	4
Authority on the exhibition's communication	
Depending on the museum and on each exhibition	3
Executive committee with the ultimate authority on the messages	5
Curatorial staff hold the authority on the exhibition level	6
Audience involvement	
Depending on the budget and time	3
During the front-end and/or summative stage (focus groups/surveys)	5
Exhibition success due to design	
Critical to the exhibition success	5
Interdependence between curation, interpretation and design	7
Design as a triad between curator, interpretive planner, and design	2

Interview questions and responses	No. of responses
3. Future challenges and areas of improvement	
Future challenges	
Funding	5
Competing with other forms of entertainment	2
Difficulty in competing with the private sector	5
Time and resource constraints in dealing with technology integration	4
Awareness of higher expectations on museums for technology integration	4
Areas for improvement	
Current exhibition development procedure	6
Interdisciplinary nature of museum exhibitions (communication)	4
More formal training (cross pollination between interpretation and design)	2