DEVELOPING THE ILLUSTRATED WORLD ATLAS

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ABSTRACT

In 2004 a new atlas product was published by Weldon Owen—The Illustrated World Atlas. This atlas is an entirely new product, and was conceived, designed and produced for global publication. The atlas is intended to provide a contemporary picture of the world and it is aimed at the general map user market. The compilation and production process involved bringing-together a group of experts, globally, who contributed their skills and knowledge to the project.

This paper provides background to the publication and it gives an overview of the market that the atlas addresses. It describes the process of information compilation, data verification and final map content assembly procedures. It then details the production procedures followed and the specific techniques applied to atlas production. Finally, the various editions of the atlas are outlined and their unique elements described.

INTRODUCTION

Atlases have always been an important part of tools for “finding out” about geography. They provide a composite resource of information that enables a focused study of a country or a region; or a more general “browse” of continents and oceans. We almost take for granted that atlases are “there” on the bookshelf in a library or available to purchase in a bookshop. They provide the means to “armchair travel”, to undertake focused research or to support educational programmes. Their elegant design, innovative presentational methods and functional layout allow users to find the information desired, pore over the selected pages and be better informed about countries, cities and places of interest. The paper atlas has provided the means for geographic exploration and discovery without leaving one’s home, school or office.

Atlases do not just “appear” on shelves but they are the product of many hours work from idea to data assembly to production to reproduction and distribution. Contemporary publishing houses have developed a systematic approach to atlas production. However, they are not just a “publishing machine”, but organisations that develop and nurture products that meld art and technology to produce artefacts that are technically correct, artistically elegant and efficient conveyors of geographical information.

This paper explores the development of one of these contemporary cartographic products—The Illustrated World Atlas. It was published in 2004 after a number of years’ development. The paper also outlines the design and production procedures carried out by the atlas publisher, Weldon Owen, an Australian company based in Sydney but with international resources and activities. Finally it discusses future products being developed as part of the Weldon Owen “family” of geographical products.

CONTEMPORARY ATLAS PRODUCTS

Paper atlases have provided the means by which armchair travellers could “go” to places from the comfort of their lounge or study. They allow students to study geographies so as to better understand the world. And they give users a tool to explore and discover the world. It has been claimed that maps were in fact the first multi-media products—as they contain text, diagrams, graphics (as ordered symbols) and geographical facts.

Atlases have always been important tools for understanding geography. They provide a composite resource of information that enables a focused study of a country or a region; or a more general “browse” of continents and oceans. The interest in using the atlas as a teaching resource is typical of most geography education programmes. Atlases are an important tool to support the development of spatial skills that need to be learnt/developed in geography programmes and then used later in life to inform oneself about the world. These spatial skills, according to Le Sann [1] are:

- The abilities to observe, register, represent construct diagrams, analyse, interpret and write descriptive and analytic text;
The abilities to observe, devise a plan, choose a legend, develop the notion of scale from the observation of real space, and to understand orientation and use a compass;

The ability to read, analyse statistical data, formulate conclusions, do research on simple questions, register answers, classify, analyse and interpret meaning;

The abilities to construct a table with data from a descriptive text and then to analyse, understand, choose a legend to represent different kinds of data (quantitative or ordered), complete and interpret a map and to draw conclusions; and

The abilities to question, research, register, think, classify, understand and interpret cartographic and administrative materials.

The cartographic information provided by atlases is not just “pictures and words”, they must also include meaning and sense of the representative map content. Therefore atlases have a definite informational quantity and quality. This information is organised around a number of basic elements, and this determines the genre of atlas designed. These can be:

- Scientific/technical/economic atlases, that inform about the nature of geography;
- Topological/geographical/historical atlases, that are constructed around a theme; or
- Popularising/educational/directive atlases, which have a specific purpose behind their design.

Atlases are part of a cartographic communication system and they need the “correct” mapping situation to provide an effective “chain” of information delivery. As well as the genre of an atlas, influences on how they are designed can be attributed to a number of factors, which include:

- Heritage—the way in which publishing firms develop and present their products, and users expect their products to accord to a family style;
- Personal and professional development—atlases linked to activities like travel, better understanding the world and personal development;
- Confidence/status—atlases that are seen as an authority about the world, countries, regions and cities;
- Education—atlases linked to educational programmes;
- Technology—atlases that are the result of a technological process, rather than a purpose-built product (maps produced from a Geographic Information Systems (GIS) product fall into this category); and
- Society’s needs—atlases produced in order to satisfy a demand for a particular type of product or developed to inform about a specific topic.

So, what constitutes an “ideal” atlas in a contemporary publishing era? It can be defined by many elements, all complementary and mutually supportive. This includes the ability to realise designs using a complete digital compilation and storage system, allowing processes from design, to data processing and artwork development to be undertaken as one complete automated package. The system around which the atlas is “built” must provide electronic output and enable colour facsimiles or separations to be provided at a number of publishing stages. The atlas design must be logically structured around a central theme or place. It must be consistent in design with text and symbology used in a unifying theme. For general-purpose atlases the design generally is completed under the directions to display of relative, rather than absolute values, but providing consistent scales to enable comparison, from region to region, country to country. It will provide the means to effectively view natural phenomena, cultural features and national/global trends, providing an effective way to understand historical and current geographical information and to perhaps be able to assist in predicting trends.

To ensure that efficient products are published the atlas publishing industry needs to think differently about what they produce. They need to be lateral in their thinking and they must embrace new formats and develop innovative ways of looking at cartography, maps and map use. And, they must be economically, technologically and (map) recipient aware.

THE ILLUSTRATED WORLD ATLAS

This 304-page title is an illustrated family reference atlas. It combines sophisticated cartography, newly created for this book, with authoritative text, hundreds of photographs, satellite views, illustrations, diagrams and charts to present a comprehensive portrait of planet Earth.

Atlas Editions

The standard edition of the atlas has been sold to publishing partners in Australia, France, Germany, Norway, Netherlands and the United Kingdom. In addition to these editions, clients in the USA and Spain requested versions of the atlas that were tailored to their specific markets.

US Edition:
The atlas was sold to a US publishing partner while the production schedule for standard edition was less than half completed. The US client requested significant amendments to the content of the atlas to make the title more competitive in the US market. In particular the client required an increased number of maps covering North America, some amendments to the design and an alteration to the page ordering to place the maps of North America at the front of the mapping section. The amendments required by the US client meant that Weldon Owen needed to create 25 new maps, repaginate the book, send every page for reproofing and create a separate index for this title. The client also required the atlas for publication at date earlier than the standard edition. These tasks presented a management challenge and, in particular, required that we revisit the production schedule for book, hire new staff and engage a US-based cartographic consultant.

**Spanish Edition:**
Weldon Owen sold the US version of the atlas to a Spanish publisher. This client required additional maps covering Spain and an alteration to the page ordering to place the maps of Europe at the front of the mapping section. To achieve these amendments we created 3 new maps, repaginated the book and revised the index to accommodate the new maps and new page order.

**THE ILLUSTRATED WORLD ATLAS CONTENTS**

*The Illustrated World Atlas* is designed for the general family audience. It is not a traditional atlas, or “book of maps”. The central maps are accompanied by text, supporting maps presenting population distribution and regional land use, three-dimensional terrain views, photographs and illustrations.

![Sample double-page spread from The Illustrated World Atlas.](image)

The atlas is divided into 3 sections. The first, “World View”, is a series of 16 double-page thematic spreads covering geographic topics, such as climate, landform, natural resources and several cultural and social topics such as religion, languages and indigenous people. The second section, “Mapping the World”, comprising the majority of the book, contains 68 regional maps arranged by continent. Physical and political maps of the world are followed by physical maps of the oceans. For each of the six populated continents, the following is included: a double-page spread of satellite views; physical and political maps; and an additional feature on the human impact on the continent. A detailed map of Antarctica and a double-page spread focusing on the human impact on that continent concludes the mapping section. The final part of the atlas is a reference section containing illustrated world geographical comparisons, world time zones, a fact file featuring important statistics of each country in the world, a glossary of geographical terms and the index.

**WELDON OWEN**

Weldon Owen Publishing is an international book publishing company whose principal business is the creation, development and production of premium quality illustrated reference and lifestyle books for adults and children. Occupying a unique niche between traditional publishers and editorial development companies (often referred to as book “packagers”), Weldon Owen has developed a successful business by creating award-winning books for the international marketplace in multi-language co-editions that sell in million-unit volumes.

The company’s usual scope of work involves designing, creating, producing and delivering finished, printed books to its customers, who include trade publishers, direct marketers, specialty retailers and others. The company has offices in San Francisco, USA; Sydney, Australia and Auckland, New Zealand.

**ATLAS BACKGROUND**
The Illustrated World Atlas occupies a niche market within atlas publishing. This title was created specifically for the international co-edition publishing market. The methods used to sell this title to publishing partners are explored below.

**Market Overview—Illustrated Family Atlases**

The majority of atlases available in the marketplace are traditional atlases (such as *The Times Atlas of the World*) that contain “stand alone” maps without additional supporting material on the page. Illustrated atlases do not form a large sector of the atlas market. Dorling Kindersley produce a range of illustrated atlas titles (such as *The Concise Atlas of the World*) that feature regional maps accompanied by supporting maps, illustrations and other graphics. The Random House title *Geographica* is a variation on the illustrated atlas—it features “stand alone” maps accompanied by illustrated fact files for each country. These products are the most direct competitors to *The Illustrated World Atlas*.

**Selling the Atlas**

Weldon Owen’s business practice is to develop ideas for new books, present them to co-edition publishers and obtain a commitment from one or more publishers before commencing work on a project. The concept for *The Illustrated World Atlas* was developed, a table of contents was created and several presentation spreads were created and presented to international publishers.

When it was established that there was a significant level of interest in the project further research and development was undertaken. The table of contents was revisited and expanded to include more detail. A 16-page promotional booklet, containing seven sample double-page spreads, was designed and printed. This booklet featured the various types of spreads intended to be included in the atlas and showed potential clients the design elements and final print quality of the title. On the strength of the presentation booklet, the publishing rights for *The Illustrated World Atlas* were sold to publishing partners in Germany and France. This enable Weldon Owen to begin production.

**SETTING UP THE PROJECT**

**Establishing the Team**

*The Illustrated World Atlas* required a team of over 70 people both in-house and offsite. The project was managed by the in-house project manager, the design elements were controlled by the in-house art director, the cartography was overseen by the offsite chief cartographer and the offsite cartographic consultant. There was a core in-house team comprising the project manager, the art director, a designer, a design assistant and an editorial assistant. Offsite were the project editors, a designer, the picture researcher, the cartographic team, the illustrators and the consultants. The in-house team was responsible for reviewing all the pages of the title to ensure consistency of style and accuracy.

In effect the project required three sub-teams working on each section of the atlas. The first section of the book involved an offsite team comprising a project editor, a designer, a picture researcher, several cartographers and illustrators, the cartographic consultant and 20 specialist academic consultants. The regional map section involved the project manager, the art director, a project editor, a designer, a design assistant, an editorial assistant, the chief cartographer, a team of cartographers, several map reviewers, a picture researcher, several illustrators, the cartographic consultant and 31 regional consultants. Production of the reference section was undertaken by the in-house team, an author and several consultants.

**Production Schedule**

Production began on the atlas in October 2002 and the first printing was scheduled for early June 2004. The total production time was less than 20 months. The project manager created a schedule that outlined a week-by-week breakdown of the workflow including the tasks required for each team and sub-team plus the key milestones.

The three sub-teams had differing workflow and tasks. The work for each team was divided into batches, eg. 5 regional map spreads per batch. The production of these batches was staggered so that the pages were worked on in stages and material was sent to the printer progressively. This encompassed the design and editorial deadlines, the several review stages, pre-press production processes, proofing, proof checking and the final printing.
TECHNICAL REQUIREMENTS FOR CO-EDITION PUBLISHING

The Illustrated World Atlas was created as a co-edition publication for sale in the international market place. When finalised, all relevant files were sent to the international publishing partners to be translated. The co-edition publishers are responsible for translating the text and map labels into the language they require. The translated files are supplied to the printers to output the printed book in the co-edition language.

This placed certain limitations on the design and production of the atlas. The standard practice for co-edition publishing is to set up the layout files so that all text (anything that will be translated by the co-edition partner) is a special black called “Text black. The books are printed using five plates—the standard four colour plates cyan, magenta, yellow and black (CMYK) plus an additional plate for the “Text colour—containing text only. This process ensures that when a book is printed for a co-edition publisher the only plate that needs to be newly created and changed by the printer is the additional fifth (“Text colour) plate containing the translated text. In this way, several language versions of a title can be printed in one print run thus minimising the printing costs.

It was essential that the team made sure that all translatable text was the special “Text colour. This was checked at each stage of the production of the atlas. If a word is not coloured “Text black but another colour, the word will appear on a colour plate. To remove an incorrectly-coloured word for a co-edition printing would mean changing the colour plates which is significantly more costly than changing only the fifth (“Text colour) plate.

To accommodate various world languages a series of fonts—IWA fonts—were created for the project. Additional characters with accents not commonly used in English were added to these fonts. The new characters were assigned keystrokes in the font map—each character or keystroke not required for labels on the maps (eg. ! or @) was replaced with a special character. An extract of the adjusted keystroke map is included below.
MAP COMPILATION, ATLAS CONSTRUCTION AND PRODUCTION

The maps created for the atlas contain 2 elements—an Adobe Illustrator file, including the line work and labels, with a linked Adobe Photoshop TIFF image containing the mountain relief.

Regional Maps

Illustrator File:
The line work data for the maps was obtained from the Digital Chart of the World in DXF format. This was imported into AutoCad and saved as a DXF file. The DXF file was imported into Illustrator using MapPublisher. The data was projected into the required map projection and then scaled to the required map scale. The labels and line work were then styled to the project specifications. Each label type and map element (eg. mountain peak names and mountain peak symbols) was placed on an individual layer—up to 65 layers per map.

Photoshop File:
The mountain relief was created from Globe 30second DEM data using Global Mapper. This was imported into Photoshop as a raster image layer. The area required for mapping was masked, the image was coloured and the relief enhanced to match the project specifications.

The bathymetric data was obtained from the General Bathymetric Chart of the Oceans. The DXF file was imported into Illustrator using MapPublisher to project and create bathymetric tints. These were imported into the Photoshop file containing the mountain relief and coloured to the project specifications. This Photoshop TIFF was then placed into the Illustrated file containing the line work and labels.

Economic Profile and Population Maps

Data for these supporting maps was obtained from ESRI ArcAtlas: Our Earth Database. The data was imported into Photoshop, coloured as per the project specifications. The Photoshop file was then imported into an
Illustrator file containing the line work and labels. The placement of the economic activity icons on the Economic Profile maps was determined by a consultant.

**Thematic Maps from the “World View” Section**

The thematic maps were created using the same methods employed to develop the regional maps. The project editor determined the subject matter of the maps and then sourced the reference material for each map, including plotting desired icons or other graphics. The cartographic team used the supplied references to colour the maps appropriately and place any icons and relevant place names.

**WORKFLOW**

**Creating a Regional Map Spread**

**Stage 1—Initial Spread Layout:**

An outline of the required area was created by the cartographer. The designer used this outline (scaling it where necessary) to prepare a rough version of the double-page spread in QuarkXpress. This initial layout determined the placement and size of all elements on the spread and established whether there was adequate room to include the optional elements—the 3-dimensional maps and cityscape illustration. It was used by the cartographer to create the central regional map and supporting maps. The project editor used the rough spread to establish a word count and to suggest photos, illustrations and 3-dimensional maps.

![Figure 6. p.168-169 “Eastern Asia”—initial double-page spread layout.](image)

**Stage 2—Map Review:**

The cartographer submitted the maps to the editorial and design teams for a first review. The maps were reviewed by the in-house team, the project editor and several consultants (please see below for a detailed description of the map checking process). The consultants’ comments were combined with the comments from the in-house team and sent to the cartographer to amend the maps.

The cartographer returned revised maps to the editorial and design teams to be checked to ensure corrections were taken in and to establish that no new problems had arisen in the revision process. The maps were returned to the cartographer as many times are necessary until they were approved.

**Stage 3—Text, Photographs and Illustrations:**

At the same time the maps were submitted for first review, the project editor submitted the text to the in-house editorial team as well as a list of suggested photographs and illustrations. The text was reviewed by the editorial team. The designer briefed the illustrator about the illustrations required. The illustrator then submitted a rough outline sketch of the illustration for approval before creating the final colour artwork. The picture researcher approached relevant picture agencies and photographers to locate a selection of photographs suggested by the project editor. The designer and project editor reviewed the images submitted by the picture researcher and selected the most appropriate images.

**Stage 4—Double-page Spread Layout Review**

The design team placed the text, maps, photographs and illustrations into the page layout in QuarkXpress. The project editor edited the text and added captions as necessary. The spread was then sent to the client, publisher, creative director, proof reader and editorial team for review. Amendments were made as necessary. Once a spread was approved the design team undertook the lengthy process of preparing the files to send to the colour separator for proofing.
Stage 5—Proof Review:
Proofs were reviewed by the client, editorial and design teams, project editor, publisher, creative director and cartographer. The design and editorial teams undertook a lengthy review process to check the proofs. This included making sure the instructions to the colour house had been followed, the colour was correct, the quality of the illustrations and photographs was acceptable and ensuring the text was correct. Comments from all the reviewers were combined and any required changes were made. Annotated proofs were returned to the colour house and additional proofs were created if necessary.

“World View” Section
The pages for the “World View” section were created following the same principles outlined above. The project editor determined the content of each double-page spread. This was compiled into a design brief for the designer to use to layout the initial spread design. Following approval of the initial design, the designer commissioned maps, illustrations and graphics. These elements were reviewed at the several stages noted above before they were sent to the colour separator for proofing.

MAP CHECKING AND DATA VERIFICATION PROCESSES

Internal (design/editorial) review procedures:
Using detailed checklists created for the project, the editorial team checked all labels and map elements. Most particularly, the spelling of place names and accuracy of labelling was checked (using several reference sources for verification) and then cross-referenced against other maps in the atlas (world and continent maps and regional maps adjoining the map under review) to ensure consistency of labelling throughout the book. The design team checked all elements on the maps including ensuring the maps were created as specified in the rough layout, the colour scheme was correct and the files were set up according to the project specifications.

Consultants:
The maps, text and a rough spread layout were sent to the cartographic consultant and a regional consultant for review. Consultants were asked to check the map contents and their currency. Things like spelling caused quite an amount of research to determine the correct, current version of place names. Also borders needed checking and a specialist in border determination was consulted. As well, the accuracy of town sizes, roads, rivers, etc. also needed verification.
CREATING THE INDEX

There are approximately 35,000 entries in the index. Each entry includes the page number, grid reference, country and, where relevant, classification symbol, eg. river, mountain peak. The cartographer used MapPublisher to extract the index information from the Illustrator map files which were set up so that each type of label was placed on a layer, eg. all mountain peak labels were on one layer. The cartographer accessed each layer in the file and extracted the label, grid reference and label type, then compiled the index information for each map into a Microsoft Excel file and supplied the editorial team an Excel file for each regional map.

The editorial team checked each of these Excel files to ensure the index information was accurate and complete. Following this, the files for each continent were combined and checked for duplicated place name entries and amended as necessary. The Excel files for the continents were combined into a world index, which was checked for duplicated place name entries and again amended. When the world index was approved the data was flowed into a QuarkXPress document for page layout, then styled appropriately and edited.

The special fonts designed for the project created a significant problem when alphabetising the index. The “non-English language” characters assigned to key strokes such as “!” and “@” were not recognized by Excel when we attempted to sort the index alphabetically. We also needed to find a way to ensure that abbreviations such as Mt. and St. were alphabetised appropriately. In liaison with the IT department, the editorial team created an Excel file that contained a series of “Look Up” tables to overcome these issues. This solution reduced, by approximately 60%, the time the co-edition partners spent working on the index.

RE-PURPOSING CONTENT FROM THE ILLUSTRATED WORLD ATLAS

Weldon Owen retains copyright to the text, maps and illustrations contained in the atlas. An atlas programme based on re-purposing this material has been established.

Essential World Atlas

A 192-page paperback version of The Illustrated World Atlas, this title includes only the regional map pages from the original title. To create Essential World Atlas the pages from original atlas were reduced to 90% of their original size. The index from the previous title was adjusted for this title.

The Pocket Book of the World

This 320-page paperback title is a small-format traditional atlas. The regional maps from The Illustrated World Atlas were re-purposed to fit into the reduced page size. An entirely new index was created for this title.
The Children’s Visual World Atlas

The maps for *The Children’s Visual World Atlas* were drawn from the adult atlas then re-coloured and the content was simplified for children. An entirely new index was created for this title.

![Sample double-page spread from *The Children’s Visual World Atlas*](image.jpg)

**CONCLUSION**

In the rush towards the digital map outcome the value of atlases can be forgotten. And sometimes the real usefulness of a well-designed cartographic product can be swept-aside by those working under the umbrella of a digital (analytical) GIS world. Take for instance a comment by Dobson [2, p. 34], who stated that: “... I’m disappointed with the world atlases I’ve tried so far. Their prevailing perspective seems to be entertainment and visualization, rather than analysis”. However, good product is not just about the speedy delivery of the results of analysis from massive databases through the use of fairly generic design outputs.

Michael Wood, former President of the International Cartographic Association, supports the notion that contemporary cartography is now more than the production of maps based purely on precise geographical locations [3]. He has said about good map design: “... raising the quality of a map design from the ‘merely legible and competent’ to an ‘aesthetically attractive composition’, requires talent.” [3, p. 9]

Maps and atlases, if they are considered to be works of art as well as scientific documents, do have the ability to effectively depict information about geographic phenomena, by combining the communicative effectiveness of well-designed graphics with precise data elements. They provide the opportunity to faithfully show the real attributes of geo-spatial phenomena

The rules that govern atlas design, production and consumption have evolved over centuries, and the methods of producing them via the printing press have been established by 500 years of experiment and development [4]. But, the way in which atlases are now produced have evolved in concert with contemporary technology, especially technology that allows design concepts to be realised in efficient processes. Well-designed contemporary atlas products provide efficient tools for understanding geography and they are wonderful ambassadors for the partnership between cartography and publishing.

Those involved in contemporary mapping have always sought to find and utilise the best ways to depict the landscape or thematic data. In order to move forward in developing different (and more efficient) ways of doing this, cartographers have sought innovative approaches. It is hoped that this paper has provided an insight into the workings of a publishing house and its endeavours to publish a contemporary atlas “family”.

In order to fully appreciate the “talent” that has gone into developing a proposal for a new atlas, creating a house “style”, refining the depiction techniques and producing even better products, then the story of the “facts” behind how the final product was derived completely ignores the creative inputs to the product. This can only be appreciated by seeing the published work.

**REFERENCES**


