Full paper

Developing And Running A Photographic Website

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ABSTRACT

This paper describes how a website was successfully developed for a Wellington-based photography business by a student completing the Graduate Diploma in eCommerce at Christchurch Polytechnic Institute of Technology during 2004.

The business specialises in photography of athletics and other sporting events throughout New Zealand, and it had been identified that a website that allowed the easy uploading of photos by the business so that customers could order copies would enhance the operations of the business.

A group of students developed an initial prototype of the website as part of course work in the first semester of 2004 as an initial feasibility test and requirements gathering process. Two of these students developed the concept further as part of their cooperative education project at the end of that semester. A third student redeveloped the site in semester two of 2004 with the purpose of the site going live before the end of 2004.

The site was launched successfully in late 2004.

1. INTRODUCTION

Nesbit (2003a) described how Christchurch Polytechnic Institute of Technology (CPIT) developed the Graduate Diploma in eCommerce (Grad Dip eCommerce) during 2000 for delivery in 2001, and how it includes two possible specialisations of web programming and business strategies, with all students being required to complete a 30 credit or 45 credit cooperative education (or capstone) project as part of the qualification.

The capstone project plays a significant role in IT related degrees as described by Garrett, Youngman, McCormack, Rosescu and Mann (2003), with the cooperative education project in the Grad Dip eCommerce at CPIT playing a similar role. Garrett *et al* (2003) drawing on the work of Fincher, Petre and Clark (2001) outline the importance of finding good clients, providing a real service to clients and of the clients having realistic expectations. They further cite Fincher *et al* (2001) in describing the aim of a capstone project being to "make the learning real, by integrating theory and practice through authentic problems, processes and deliverables."

This aim expressed by Fincher *et al* (2001) is consistent with the explicit aim of the cooperative education project in the Grad Dip eCommerce at CPIT:

· To give the students the opportunity to work within an eCommerce environment and to produce a piece of work of appropriate significance.

· To ensure students have the opportunity to tie together the learning and experience from their different areas of study in a real world environment.

Nesbit (2003b) explored the relative importance and difficulty of skills needed to complete a major assignment in a level 7 course that focuses on web development in PHP (BCPR342 – Server Side Programming). In the middle of semester one of 2004, this major assignment required students to develop a simple prototype of a website for a photography business (Nesport Communications). The main requirements were to allow an administrator to create new events, and upload photos that had been taken at those events so that users could place orders for the photos. This process enabled the proprietor of the business to clarify more of the requirements for the site, with this requirements gathering process being consistent with the concept of discovery prototyping as described by Martin, Brown, DeHayes, Hoffer and Perkins (2002).

In later semester one of 2004, after consultation with the proprietor of the business, two students, as part of their 30 credit project for the Grad Dip eCommerce developed one version of the website further by adding additional features and improving some of the functionality. At the conclusion of this project it became clear that such a website would be of value to the business, with this project further clarifying the requirements for the site. For semester two, another student undertook as his project the task of taking the earlier work that had been completed, ensuring that the business needs were understood, redeveloping the website and making it go live.

The three phases that the project went through of being an assignment for a course, being a cooperative education project for two students, and the final implementation being a cooperative education project for a third student is also closely related to the phases of inception, elaboration, construction and transition in the Rational Unified Process (RUP), as described by Kruchten (2004) and many others.

2. BACKGROUND OF BUSINESS

The business commenced in November 2002, mainly as a telecommunications contractor, but also as a regular contributor of photographs and articles for NZ Runner magazine. The proprietor of the business has also been the editor of the Athletics NZ News magazine and supplied photos on a freelance basis to several other publications.

Increasingly the proprietor was getting photos loaded to other websites and getting queries from people who wanted to buy the images. There was clearly a largely unmet need for photos from running and athletics events. The proprietor saw that marketing the photos through his own website would allow him to develop this side of his business with relatively low variable costs, given the photos would be taken using digital cameras. This would also complement his work for NZ Runner and Athletics NZ, given that he was attending a variety of events anyway. It does however mean a need to photograph as many athletes as possible. The proprietor's wife is now assisting with photography of some events to help achieve this.

3. THE DEVELOPMENT PROCESS

3.1 The Process Followed

In the first semester of 2004, the students studying towards BCPR342 (Server Side Programming) were given an assignment which required them to build an application for a hypothetical firm, that was in essence an initial feasibility study for Nesport Communications. The initial requirements for this assignment are included in Appendix A. The work that the students were required to do for this assignment included:

· Clarifying the requirements of the system

· Designing, implementing and testing the underlying database

· Designing, building and testing the application

· Writing a reflection of the learning achieved

Two of the students who were working on the BCPR342 assignment met with the proprietor of Nesport Communications mid way through the assignment, with the result of that meeting seeing these two students developing the concept of the assignment in a direction that would flesh out the concept more as part of their major project for the Graduate Diploma in eCommerce. This meeting also helped the proprietor clarify what the main requirements of such a site would be. While the application that was produced by these two students was never implemented, it served two important purposes:

· At the end of the project it was possible to produce a much better requirements specification for a site that would meet the needs of Nesport Communications

· It would provide a base of code that could be used for a fully working site to be developed and implemented

On the completion of this project, the proprietor of Nesport Communications decided that he wanted development of a working model to commence. After a meeting with the programme leader, an academic staff member (who was to become the academic supervisor) and another Graduate Diploma in eCommerce student, ap-

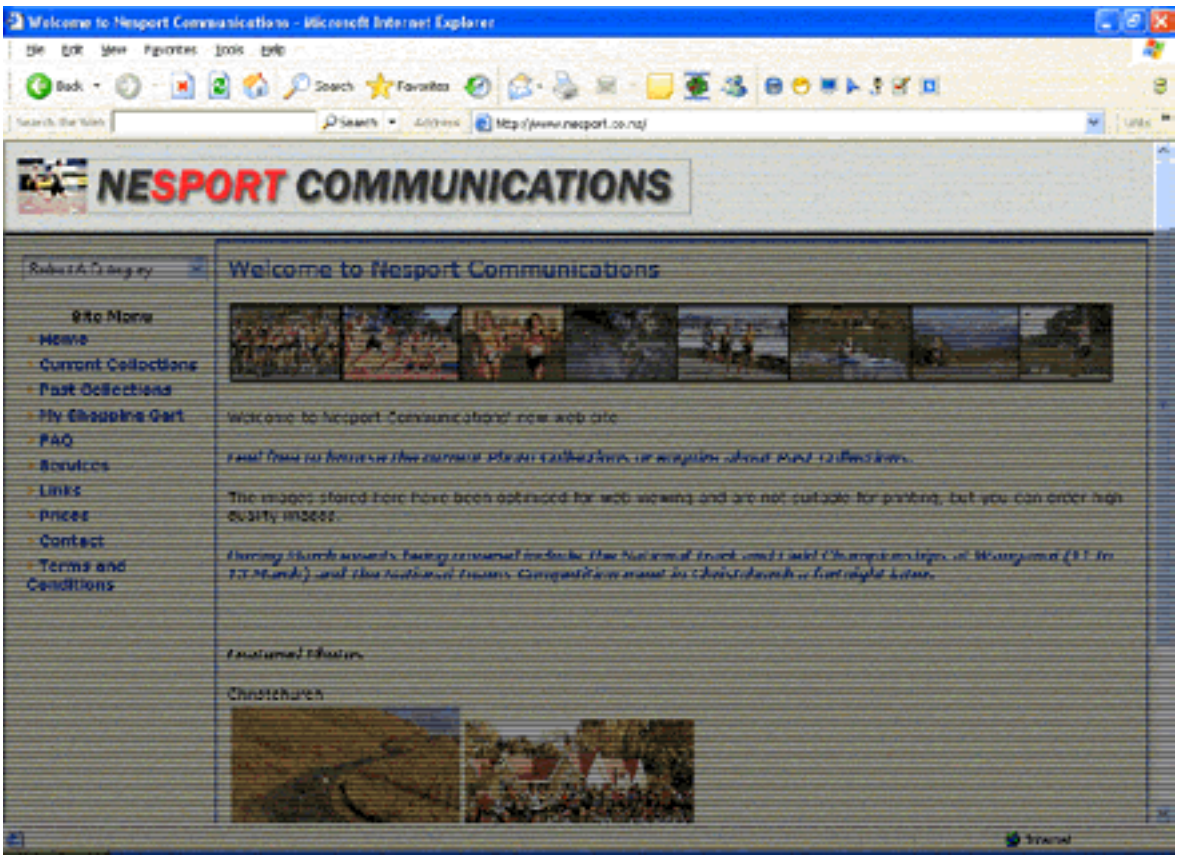

Figure 1. Home Page for Nesport Communications.

proval was given for this student to commence a project that had the aim of developing and implementing the site.

3.2 Comparison with RUP

The process described above parallels the Rational Unified Process (RUP) as described in Kruchten (2004), in particular the phases of inception, elaboration, construction and transition. In defining the inception phase, Kruchten (2004, page 62) writes "The good idea- specifying the end-product vision and its business case and defining the scope of the project". The use of the assignment in BCPR342 to build a hypothetical case in essence was testing whether the concept of such a web site was a "good idea" and helped in establishing the vision of what the site was going to be all about.

The elaboration phase defined by Kruchten (2004, page 63) includes "specifying the features and designing the architecture". In the process used, the use of the BCPR342 assignment and the first two students in developing the concept further as their major project for the Graduate Diploma in eCommerce produced a much better understanding of the required features and the overall structure of the site and how it would work.

Construction is defined by Kruchten (2004, page 63) as "Building the product and evolving the vision, the architecture and the plans until the product – the completed vision – is ready for delivery to its user community". The vision for the site evolved from the initial BCPR342 assignment, through the project completed by the first two students, to the student whose project was to fully develop and implement the site delivering a full and working product for Nesport Communications at the end of the project.

The transition places defined by Kruchten (2004, page 63) include "delivering, maintaining and supporting the product until users are satisfied". As described in the following section, the site was implemented and went live, on time. Since that time there have been minor modifications made by the student, these being made with the purpose of supporting the product and its evolving vision.

While the initial intention was not to adopt RUP as a process to provide a solution to meet

the needs of the client, in retrospect the process followed was reasonably consistent with the RUP process, and would appear to be one of the contributing factors in the overall success of the providing a solution for the client.

4. SUCCESSFUL IMPLEMENTATION AND USE

The website was launched in November 2004 with the url www.nesport.co.nz - the home page is shown in Figure 1. Since then, the proprietor has been "testing the waters" with a variety of running and athletics related events. He is finding out which types of events generate the most revenue and establishing processes to ensure participants are aware images of the event will be available. As of 3 March 2005, 56 orders have progressed through to payment. Disk usage is 48.66 Megabytes.

The business has received a number of positive comments about the website and has also been approached about other photography assignments by people who found the business via the Internet and see the website as a real drawcard. The proprietor has also sold his work to a new magazine. There has been interest in the website from overseas, but only one sale overseas to date through the website (partly because of the difficulty in transferring money from overseas). Table 1 in Appendix B shows the hits by country for the period 1 January 2005 to 2 March 2005.

The proprietor of the business has found the website very user friendly and believes the student did a very good job of assessing the business needs and suggesting features that would make it easier to use or allow for future growth. The set up of the website allows for considerable flexibility. For example, the proprietor can add new categories by using the administration tools that were developed. The main administration page can only be accessed by the proprietor, with a view of this page being shown in Figure 2. The orders system, with its automatic emails to the purchaser and the business, also works well.

5. THE LEARNING ACHIEVED

As much as any cooperative education project is a vehicle for students to demonstrate their technical skills and knowledge and apply these skills and knowledge to a "real world" requirement the project also provides a platform for further learning and reflection.

The original material created by previous groups of students involved in the initial prototype and those students who further developed the concept was supplied to and reviewed by the third student who developed the working site. At an early stage it was decided to treat the original material as prototype and to regenerate the site completely incorporating further amendments and suggestions from the client at the same time.

In summary the student recognised the following areas of learning that occurred throughout the course.

- Gaining confidence and proficiency in PHP development resulting in writing smarter code while making use of open source development tools such as PHP and mySQL.
- Further database development techniques and entity relationship diagrams.
- Enhanced problem solving skills developed with the recognition for the need to look at problems from different aspects.
- Improved communication skills.
- Successful and professional client interaction.

For web site development (web programming) projects to be successful students must have completed BCPR342 – Server Side Programming (PHP). The student successfully completed this course in semester 1, 2004. As the project moved from one phase to the next the student identified a number of aspects that could be included in the BCPR342 course to improve it and make projects such as this one a much smoother and less frustrating transition from inception to completion for the student. The student has made the following comments/recommendations regarding the course:

- Sample code given during the course was quite simple and often required a lot of modification to be of any use.
- Lack of emphasis on testing.
- Lack of emphasis on certain PHP features such as arrays.

Figure 2. Administration Page for Nesport Communications.

· No Linux platform to develop on.

· More knowledge on the use and functionality of php.ini files would be good.

· An overview of the different versions of PHP would be useful.

· Details of the availability of open source code to PHP programmers via the Internet would be useful.

Changes that have been made to the course in later semesters that address some of these issues include:

· More of a focus on object oriented development in PHP with a view to creating classes that can be used in a variety of situations

· A greater emphasis on testing, with students now being required to write test scripts to automate the testing process

· The version of PHP used has been updated to version 5

· The use of open source code is covered, with one such example being the use of open source classes to enable the generation of PDF files.

6. FUTURE DEVELOPMENT

It may be necessary to add credit card facilities to the website. Not having a credit card facility is particularly problematic for overseas buyers, as transferring money from overseas is "a hassle" and relatively expensive. Credit card facilities would be an additional cost to the business; the unknown factor is the potential revenue lost through not having the credit card option available. A small number of people have said the lack of a credit card facility put them off making a purchase, but the proprietor doesn't know how many purchases are lost that he doesn't hear about.

Making an order is currently a two-step process, the first step being the order itself, the second being making the payment by cheque or transferring the money to the business's website. Only after the payment is made are the images sent. There is a fairly high rate of orders which are not completed by making the payment – the ability to pay by credit card could reduce this attrition rate.

There may be potential to use the website to market the work of other photographers, but this has not yet been explored to any great extent.

It would be useful to be able to view the photos from particular events via a slide show

rather than what can be quite a few mouse clicks. Similarly a search facility may assist potential purchasers, but adding people's names to photos would be extra work for the business.

The orders database that is associated with the website is potentially a rich source of information about the business. As the database grows, analytical reports may move from a "nice to have" to an important business analysis tool. There is also potential to further automate the orders process, including for example generating invoices and emails to tell purchasers that their photos were on the way and automatically generating "reminder" emails for unpaid orders.

7. ANALYSIS AND DISCUSSION

With the site having been launched successfully in late 2004 it is worth considering a number of aspects of the project, based on the work of Fincher *et al* (2001) as cited in Garrett *et al* (2003) and on the aim of the cooperative education project in the Grad Dip eCommerce at CPIT. These aspects were:

- Finding good clients
- Providing a real service to clients
- Clients having realistic expectations
- Making the learning real
- Integrating theory and practice through authentic problems, processes and deliverables
- Having the opportunity to work within an eCommerce environment

In retrospect, one of the key factors that resulted in the project being a successful experience was the client, in this case Nesport Communications, having realistic expectations as to what could be achieved within the context of a student project. The fact that the site that was developed has been fully implemented and that photos are being sold off the website is a very strong indication that the project has provided a real service to the client.

The learning achieved by the student was very real as described earlier in the report, particularly when it came to the use of online discussion forums (for example the New Zealand PHP Users Group) to solve problems that were encountered during the project. With the student successfully delivering a product that enables the client's business to trade online, the student's experience has clearly been within an eCommerce environment.

With one of the critical success factors in delivering the solution for the client being the close alignment of the entire development process with RUP (Kruchten, 2004), this approach could be used in the future to deliver solutions to clients as part of the major projects completed by Graduate Diploma in eCommerce students. Along with recommendations made by the student for inclusion of additional content in BCPR342, this provides useful feedback for CPIT.

8. CONCLUSIONS

The process that was gone through to develop this website was successful from a number of different perspectives:

- The development provided valuable project work for three students for their Graduate Diploma in eCommerce, with one of these students having the added experience of making the website fully functional and handling on going maintenance work.
- The learning achieved by the student who completed the development of the project was of a significant nature and the student's analysis content has enabled improvements to be made to the server side programming course.
- The final result provided a website that is of significant value to the client's business.
- The process of using a sequence of course work and successive student projects in a manner similar to RUP has provided a model that could be used in the future to provide similar value to other business clients.

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APPENDIX A – REQUIREMENTS FOR THE BCPR342 ASSIGNMENT

Banana Photographs Limited (BPL) is an owner-operated business where the owner takes photos at different events and sells high quality photos to people who want photos of the events for whatever reason.

The owner has decided that it would be good to have low resolution copies of the photos on a website so that prospective customers can choose what photos they want, after which the owner will create high quality copies of the same photos and send them to the customer (either on CD or printed versions).

The events can be of a number of different types with athletics meetings being common. Each event is hosted by an organization that has a contact person, with a number of the organizations hosting a number of events over a period of time. At each event, a number of photos are likely to be taken, and it should be possible for customers to be able to view the photos based on the events that they were taken at.

The owner of the business should be able to log in to the site and (a) create new organisations, (b) create a new event for an existing organisation, (c) upload photos for existing events and (d) update basic content on the site including contact details, and adding/deleting/modifying services offered and links to other sites.

Customers should be able to log in to the site, and if necessary self-register for the site. Once they have logged in, they should be able to navigate easily to an event of their choice, and view the photos that were taken at that event, and select the ones that they wish to purchase.

Once the photos have been selected, the details of the order should be saved. Initially the payment for the order will be by cheque that is sent to the owner. The photos will only be sent to the customer when the payment has been received.

At any stage the owner should be able to log in and (a) see orders that have been placed where payment has not been received (b) record the receipt of a payment and (c) record that the photos have been sent to the customer.

APPENDIX B - HITS BY COUNTRY

Hits by Country From 1 January 2005 to 2 March 2005.

Countries	Pages	Hits	Bandwidth
New Zealand	34294	227282	1.51 GB
Australia	12582	69222	418.67 MB
United States	9368	65130	515.32 MB
Great Britain	785	5076	35.24 MB
Japan	561	3551	23.21 MB
Hong Kong	482	3102	18.02 MB
European Union	155	1041	7.30 MB
Canada	104	693	5.68 MB
France	95	1012	4.33 MB
Czech Republic	72	862	4.15 MB
Unknown	65	424	2.81 MB
Philippines	53	449	2.96 MB
Cook Islands	44	275	1.61 MB
Singapore	27	183	1.55 MB
Germany	25	102	775.15 KB
United Arab Emirates	22	22	206.58 KB
Netherlands	16	91	822.95 KB
China	16	115	787.54 KB
Spain	13	98	653.01 KB
Sweden	8	48	512.89 KB
Poland	7	24	193.81 KB
Italy	4	32	214.56 KB
India	3	24	348.81 KB
Switzerland	3	34	292.61 KB
South Africa	3	16	114.53 KB
Slovak Republic	2	7	56.09 KB
South Korea	2	16	114.44 KB
Israel	2	2	294 Bytes
Belgium	2	20	251.15 KB
Russian Federation	2	2	0
Uganda	1	8	22.57 KB
Denmark	1	8	131.84 KB
New Caledonia (French)		9	78.20 KB