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# To what degree do corporate designed portal software solutions support K-12 learning needs?

Dissertation

National
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I hereby certify that this material, which I now submit for assessment of the programme of study leading to the award of Master of Science in Learning Technologies is entirely my own work and has not been taken from the work of others save and to the extent that such work has been citied and acknowledged within the text of my work.

Signed: ...............................

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# Table of Contents

# Index of Figures

# Acknowledgements

# Abstract

This study investigates what value software supplied by corporate vendors brings to an education environment. The study explores to what degree corporately produced Knowledge Management and collaborative software that is primarily developed for corporate environments can be of benefit to K-12 educators and students.

This study is based on the implementation of a content management system based on Microsoft Office SharePoint Server (MOSS). Many school districts in the United States use this system.

This study took a twofold approach to collecting data; key product stakeholders were identified and interviewed. The stakeholders ranged from sales and marketing individuals to more technical focused individuals. The data collected from the interviews was validated in an online survey with 28 teachers from a school in Gilford County, North Carolina participating. The participants are all frequent users of the MOSS based content management system.

In general the vast majority of teachers are satisfied with the content management system however most felt that the system is not being used to its full potential as there are numerous requests for more digital content to be made available.

The system had an extremely quick time to market as a lot of the system features came "out of the box" with MOSS. System administrators claim ongoing support of the system is challenging, this is primarily due to the skills required to administer MOSS. MOSS governance means that tasks such as data migration and iterative releases are time consuming in comparison to custom built solutions.

Findings suggest that most users are not aware that the system is MOSS based and that they are impressed with the systems collaborative offerings. Troubleshooting support issues are frustrating as unique MOSS skills are required for such interactions.

This study discuses the perceived advantages and disadvantages that were identified. Although the system is of benefit to users the study concludes that such a system has a negative impact on the overall K-12 learning environment, this is mainly due to maintenance overheads and high costs of the system.

# 1. Introduction

The chapter will outline the purpose of this dissertation. It will also list and explore the reasons and justification why this particular area was chosen. The research question will be introduced along with research objectives. The researcher's background will be communicated. An overview of the dissertation structure is included along with a short summary of each chapter.

Software vendors such as Microsoft, Oracle and IBM have traditionally produced software for corporate environments such as financial institutions. The main driver of this is the desire for corporate organisations to make their businesses more effective. Organisations desire to be effective generally results in them having relatively large budgets to spend on software, this results in software vendors positioning their business strategy to cater for corporate organisations' software requirements. Over the last two decades there has been a large increase in the number of homes owning a personal computer (PC); with this some software vendors have been extremely successful in producing software specifically for the home PC user. Microsoft is a prime example of this. In more recent times schools have began to use software to assist educators and provide a more effective learning experience. Before schools can fully embrace software technology the infrastructure has to exist. Only recently the Irish government has unveiled plans to have a laptop in every classroom in Ireland. "EVERY CLASSROOM in the country is to get a teaching laptop" (Flynn, 2009, p. 3). After some initial investigation it was discovered that the majority of schools in the United States (US) have been using computers in the classroom for a number of years, additionally US schools have been using education designed software since the late 1990s. After further investigation, it was discovered that a content learning management system that is built on a Microsoft portal solution is widely used in US schools. For these reasons the majority of primary research for this dissertation has been conducted in the US. This study investigates if there is an opportunity for software designed for a corporate organisation to be of benefit to educators and students in the classroom.

This is captured in the research question "To what degree does corporately designed portal software support K-12 learning needs?"

In order for the research question to be answered a number of objectives need to be met:

- To measure if the content management system adds value to educators and students in the classroom environment.

- To determine if the Microsoft Portal software is technically a viable solution for a school environment.

## 1.1. Research Background

The researcher has worked for education publishing companies for five years. More specifically the researcher has been involved in developing learning platforms for two different audiences, a corporate audience and an educational audience. While working in an office environment the researcher regularly uses his employer's corporate portal. Exploring the possibility of combining portal technology with typical learning platform features is the motivation for this study. Through experience the researcher knows that designing a learning platform for a corporate environment differs from designing one for a learning environment such as primary or secondary level schools. The researcher was interested in exploring how well this combination would work in a learning environment considering that portal solutions are generally designed for corporate environments.

Throughout the five year period the researcher has worked on many different learning projects both on the text book publishing and digital publishing aspect of the industry. This has enabled the researcher to build up a vast network of individuals that are involved in the e-Learning industry. Some of those individuals work for an organisation called Houghton Mifflin Harcourt (HMH). "Boston-based Houghton Mifflin Company is one of the leading educational publishers in the United States, with more than $1.4 billion in sales. The Company publishes a comprehensive set of educational solutions, ranging from research-based textbook programs to instructional technology to standards-based assessments for elementary and secondary schools and colleges." (Houghton Mifflin Harcourt, 2010).

## *1.2. Research Approach*

The primary data collection approach is twofold. Five key stakeholders of the MOSS based content management system were interviewed either in person or on the phone. The interviews were semi-structured and the preference was for these interviews to be conducted face to face. For logistical reasons it was not possible to conduct two of the five interviews face to face and as a result the two interviews had to be conducted via the phone. An anonymous online survey was also conducted. The participants of this survey are K-12 school teachers that frequently use the MOSS based system. Twenty four of the forty participants targeted successfully completed the online survey. The online survey contains thirteen questions with eighteen opportunities to capture opinion via the likert scale. Indicators from both sets of data collection results are then identified, discussed and recommendations are suggested.

## 1.3. Organisation

This section will mention and briefly describe the contents of each chapter.

Chapter 1 introduces the researcher and briefly mentions the topic that is being researched and its objectives.

Chapter 2 conducts research that explores educators' requirements from a technology perspective. The chapter starts off by exploring general technology requirements and needs and then focuses more specifically on the K-12 classroom requirements.

Chapter 3 discusses the research hypothesis. It also outlines the research question and problem area. The method used to identify the primarily data collection strategy is outlined. The delivery of the data collection method is presented.

Chapter 4 articulates the primary data collection findings. It outlines what learning needs are addressed and the ones that are not addressed. It also presents the perceived advantages and perceived disadvantages that were uncovered. The different data sources are mentioned and their importance is outlined.

Chapter 5 draws together the primary data collected and discuses the findings in detail.

Chapter 6 communicates the research conclusions and presents recommendations made by the researcher.

Chapter 7 gives concluding comments on the research work and indicates directions that future investigations might take.

## 2. Literature Review

The area being researched is corporate software solutions in the K-12 classroom. Before the research question is introduced it is first necessary to establish the theoretical foundation. This is broken into three different conceptual areas:

**Learning Needs:**

This area focuses on teaching and learning needs that are not specific to the research question. It is a broad look at teaching methodologies and the process that exists to support classroom teaching.

**Technology Integration in the Educational System:**

This introduces the concept of using technology in a learning environment. More specifically it looks at using technology as tool that is of benefit to educators and students.

**Corporate Portal Software:**

This area specifically explores the software that the primary data collection focuses on. The software is defined and its offerings are outlined and compared to more traditional learning software such as a Learning Management System (LMS).

## 2.1.  Learning Needs

"These needs comprise both essential learning tools (such as literacy, oral expression, numeracy, and problem solving) and the basic content (such as knowledge, skills, values, and attitudes) required by human beings to be able to survive, to develop their full capacities" (Spring, 2000, p. 6). The needs that the author is referring to are learning needs. The author specifically mentions tools and content as being the characteristics of learning needs. This concept may be extended further by saying that a learning need can be a property of a student and that a resource such as a tool or content can help address the learning need.

There are a number of theories of learning. These are also referred to as the paradigms of learning or pedagogies.  The main theories include:

- Behaviourism

- Congnitivism

- Constructivism

- Humanism

"Behaviourism is a worldview that assumes a learner is essentially passive, responding to environmental stimuli." (Learning Theories Knowledge Base, 2010). Stimuli can be positive or negative. The learner response may be a knock on effect from the educator presenting environmental stimuli. A child learning to swim may be positivity encouraged. The child learns to swim because it is in a positive environment. Schunk (2009, p. 39) presents the example of a child developing the fear of woods after becoming separated from its parents. The child learns a fear because of its environment.  In both cases the child is conditioned by environmental stimuli.

"Cognitive information processing theories focus on how people attend to environmental events, encode information to be learned and relate it to knowledge in memory, store new knowledge in memory, and retrieve it as needed" (Shuell, 1986). Unlike the behaviourism it recognises that individuals are not simply programmed. It supports the theory of individuals having the ability to

intake knowledge from their environment and build on information that exists in memory.

"Humanism is the spirit of learning that developed at the end of the middle ages with the revival of classical letters and a renewed confidence in the ability of human beings to determine for themselves truth and falsehood" (Edwords, 1989). The humanism paradigm is built on the concept of people acting on the principal of values. It supports individual initiative and trusts that learners fulfil their potential. The paradigm is in contrast to the behaviourism theory.

"Constructivism has been an underlying pedagogy that has influenced education since the middle of the twentieth century and continues to form an important foundation for e-learning." (Jain, Tedman, & Tedman, 2007, p. 1). Classroom based learning whether it is at a primary, secondary or tertiary level generally applies the constructivism theory. This allows the educator to build on the previous class or lesson. From an educator perspective origination skills are required to ensure that the lesson follows on from the previous lesson. This can be achieved in many different ways, the educator may simply remember where they last left off or they may write it down in a calendar. This is an action that the educator needs to complete so that the curriculum is fully taught in a particular timeframe. A semester and an academic year are typical examples of expected timeframes. The calendar is then considered a tool that satisfies an educators need or requirement. Loucks-Horsley (2003) reinforces this argument that educators must have good organisation skills. She states "student performance will not improve unless staff and organizational performance improves" (Loucks-Horsley, 2003, p. 56). She also argues that teachers have the most direct impact on student learning. Educators' needs or requirements are just as important as students learning needs. If an educator does not have what is required (the requirement may be a skill or physical tool like a calendar or pencil) then they are not positioned to fully conduct a lesson or group of lessons. This has the knock-on effect of negatively impacting the student.

Educators and students are involved in education at many different levels and at many different global locations. When practicing the constructivism theory qualified educators generally conform to similar approaches and process, this is the building upon lesson after lesson strategy. There is generally governance that ensures that the educators have the required qualifications and skills. This is not necessarily true for students. There are many factors that contribute to students' abilities, skills and knowledge. Capper and Frattura (2009) argue that all individuals are unique, "we believe that all people (students and staff) have a continuum of needs-physical, social, intellectual, emotional, and spiritual- that fluctuate and vary over time, depending on circumstances and situations. These needs are never stable but, rather, are constantly evolving and changing." (Capper & Frattura, 2009, p. 1). This strengthens the case that students have more individual needs than educators, particularly young students who are at the start of their schooling life cycle. In third level education there are minimum entries requirements, classmates' attributes are generally closely aligned compared to primary or secondary levels of education. Capper and Frattura (2009) also talk about individual uniqueness. Other individuals have also recognised unique needs that students require. Rosenberg (2009) discusses the idea of personalized learning. Although Rosenberg's (2009) speech is primarily technology focused, the concept is similar to the individual uniqueness concept that is introduced in the Capper and Frattura (2009) book, "Meeting the Needs of Students of ALL Abilities: How Leaders Go beyond Inclusion". Capper and Frattura (2009) recognise that students have a requirement for individuals' learning needs, Rosenberg (2009) also recognises this requirement but he goes one step further and talks about the potential for tools to exist that realise this requirement. Other authors also identify individual student learning needs, "Basic learning needs of individuals and communities differ according to their perceptions of these needs." (Singh, 2005, p. 7). All parties approach the topic from different perspectives but yet they voice similar views.

Similar learning needs exist within different learning environments. An example of different learning environments may be primary or secondary; they can also be

location or cultural related. Both Singh (2005) and Cummings & Williams (2008) recognise that similar learning needs exist in diverse learning environments. Singh (2005) focuses on meeting learning needs in the informal sector. Informal sectors are generally regions that are associated with developing countries. Typically learning resources in developing countries are scarce in comparison with developed countries. This potentially can also have an impact on educators' ability to teach. "Children, youth and adults in the informal sector have unmet basic learning needs. Such needs vary according to age, gender, context and culture." (Singh, 2005, p. 7). There are four varying student factors that Singh (2005) identifies. They are age, gender, context and culture. These varying factors may also exist in developed countries, Singh (2005) talks about these being more extreme in the informal sector, he argues that the reasons for this are mainly cultural and lack of resources. In slight contradiction to this concept Cummings & Williams (2008) argues that the main reasons for additional learning needs in developing countries are mainly due to the lack of structure in the educational system and that the introduction of policies would greatly help reduce any short comings. "At the World Conference on Education for all (WCEFA) held in Jomtienm Thailand, in 1990, governments, UN agencies, bilateral and multilateral donors, professional bodies, and NGOs pledged to launch an international cooperative effort to meet the basis learning needs of people deprived thus far of access to education. Learning needs were defined to include both essential learning tools (such as literacy, oral expression, and problem solving) as well as the basic learning content (knowledge, skills, values, and attitudes) required by human beings" (Cummings & Williams, 2008, pp. 113-114), policies cannot be introduced unless all governing parties are in agreement. This takes time and the pledge agreed has still not been fully implemented even though it was agreed on in 1990. Both Singh (2005) and Cummings & Williams (2008) are in agreement that there are additional learning needs in developing countries in camparision to developed countries. The fundamendal learning needs such as the need to build on the previous lesson do exsit in both sencerios.

So far we have reviewed learning needs general to all three formal levels of education. As individuals progress their learning needs change. When a student enters the third level education arena, generally their subject focus is very specific. This allows for very specific learning needs to be identified. Education does not stop when an individual graduates from college. Eve (2003) is a general practitioner (GP) that discusses how to continue to identify learning needs after an individual leaves formal training. He argues that continuing to identify learning needs while in the work place results in becoming a better educated GP. "The following consultations are all real ones of my own, although the patients' names have been changed. They are here to show that reflecting on your consultations not only helps you discover your learning needs but that the process of reflection is educational in itself." (Eve, 2003, p. 45), he conducts a series of observation experiments that helps him identify learning needs. The learning requirement is then fulfilled and this results in a better service to his patients. This is a very specific real world example; there is no reason why those learning needs cannot be feed into third level educational institutions and fulfilled. Similar learning strategies can also be applied when focusing on the other end of the scale. Hurwitz and Day (2007) also identify learning needs through observation. The subject is art and the participants are primary school students. The approach is the same as the one outlined by Eve (2003). Hurwitz and Day (2007) identify individual needs from a wide range of students. Some students have special needs while others exceed expectation however the method used for identifying those needs is the same. Hurwitz and Day (2007) also mention reflection as a method of education, the student is also encouraged to reflect on the painting that they have completed. Eve (2003) only talks about the educator reflecting, although aspects of Eve's (2003) experiments indicate that the educator is also the student. The educator identifies gaps but when the educator is reflecting he or she is learning and therefore is also the student. Observation can identify learning needs, extending this concept by reflecting has the potential to fulfil the identified learning needs.

MacIntyre (2005) also recognises observation as an important process for identifying learning needs. She describes the benefits of watching primary level students with learning difficulties such as attention-deficit hyperactivity disorder (ADHD) play with a view to identifying the students' learning needs. According to MacIntyre (2005) the majority of students with learning difficulties have additional learning needs. This has the effect that educators who teach students with learning difficulties have additional teaching requirements. Generally the educator is required to invest more time with students with special needs and as a result this leads to educators giving direct instruction to students. "Although direct instruction has earned a bad reputation over the years, there is nothing wrong with direct instruction in and of itself. It is the overreliance on direct instruction that inhabits learning. The key is to match your instructional approach to the subject matter and the teaching needs of your students. Direct instruction is an efficient means of helping students learn and can be very effective with helping students acquire certain types of knowledge." (Jackson, 2009, p. 178). This quote reinforces the argument that direct instruction can be of benefit to students. Talented students, average students and special needs students can all benefit from direct instruction. Jackson (2009) argues that direct instruction also fits well with the constructivist learning theory and that approaches such as coaching, facilitating, discussions, guided inquiry, Socratic seminars, and problem-based learning are recommended.

Komives and Woodard (2003) outline how students can be successful. "Three general types of student goals are enrolment goals, academic goals, and social experience goals." (Komives & Woodard, 2003, p. 317). Enrolment goals are of more interest to students aiming to attend a third level intuition. While social goals are an important aspect of building an individual's character, they are often difficult to define. Setting academic goals often leads to learning needs being identified. To get too goal "a", then "x", "y" and "z" are needed to get there.

Learning needs exist at all stages of educational life, the same ones can always exist throughout an educational life time. New needs can be identified and fulfilled on a daily, weekly, monthly or yearly basis. The educator can temporally

become the student in order to fill a learning need and the student can temporally become the educator whether they are addressing their own learning needs or addressing their peers learning needs through collaboration. Learning needs have few boundaries and common denominators. Love, Stiles, Mundry and DiRanna (2008) discuss the concept of collaborative learning amongst teachers and students. Love et al.'s (2008) opinions ignore pedagogical aspects as the main focus is how analysing data and passing on meaningful results to educators and students can be off benefit; the concept of collaborative learning is outlined in a positive manner. O'Donnell, Hmelo-Silver and Erkens (2006) discuss the comparisons between structured and unstructured collaborative learning and that from a conceptual perspective collaborative leaning has a positive impact on learning.

Evidence gathered from reports published by the National Centre for Education Statistics (2010) suggest that the United States K-12 education system does not rank well when compared with 29 other developed countries. Statements such as "Either the kids are getting stupider every year or something is wrong with the education system" (Guggenheim, 2010) and "Your children and future generations are on the bridge of the titanic and everybody is going to drown" (Guggenheim, 2010) are made in the documentary film called "Waiting for Superman". The documentary identifies the reasons why K-12 schools are failing the students and also identifies potential resolutions. Resolutions include financially rewarding good teachers, guaranteeing teacher resources and introduction of common core state standards. "The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them" (Common Core State Standards Initiative, 2010). Traditionally standards have been managed at local level either by the district or state. A national approach should support more consistent curriculum alignment. Generally it is recognised that that the K-12 education system has short comings and it is expected that the K-12 education industry in the United States will undergo reform in the coming years.

The curriculum alignment strategy that K-12 schools practice is a component of the constructivism learning theory. This section has identified learning methods such as observation and reflection; these methods have the potential to support the constructivism learning theory. Learning needs fulfilled can help a student reach their learning goal this complements the constructivism learning theory. Tools can support a students learning need and expedite learning goals. Such tools can be driven by technology. The next section introduces the role of technology in the educational environment and discusses how technology can help fulfil learning needs. It also introduces the concept of technology improving collaborative leaning.

## 2.2. *Technology Integration in the Education System*

"Back in the beginning of the microcomputer era, the early 1980s, I used as a theme for several papers and speeches, "the three Phases of Education Computing. The three phases I identified were familiarization, acquisition, and integration. The point I tried to make with this theme was that the educational computing movement started out as an effort to simply familiarize educators about the potential of the microcomputer as an education tool." (Johnson, Maddux, & Liu, 1997, p. 1). Since the explosion in use of microcomputers, or personal computers (PC) as they are more communally referred to as, individuals have been trying to figure out how they can be best used in the education environment. The above quote from Johnson, Maddux, & Liu (1997) identifies three phases of education computing.

- Familiarization

- Acquisition

- Integration

Both educators and students would need to be computer literate. Tashner (1984) outlines concerns for teachers using computers as an education tool. These concerns include availability of computers and typing skills. These concerns were identified at the start of the explosion in PC use and have since become less of a

concern due to teachers becoming familiar with PCs through use in the private life, while studying to be a teacher or while teaching. Investment in new technology is generally slow. This applies to all industries not just the education one. Even though PCs' were available in the mid to late eighties schools in the United States did not start to adopt this technology until the mid to late nineties, this argument is reinforced by Toshiba and Microsoft (1997). According to Roblyer (2004) two assumptions need to be made before acquiring technology for an educational environment. The assumptions are:

- Educators have considerable knowledge about current technology applications in their content area

- Educators have skills in using various technology resources

Roblyer (2004) outlines a strategy for acquiring and integrating technology; he refers to this strategy as the "Technology Integration Planning" (TIP) model.

**Phase 1: Determine relative advantage**

**Phase 5: Evaluate and revise integration strategies**

**Phase 2: Decide on objectives and assessments**

**Phase 4: Prepare the instructional environment**
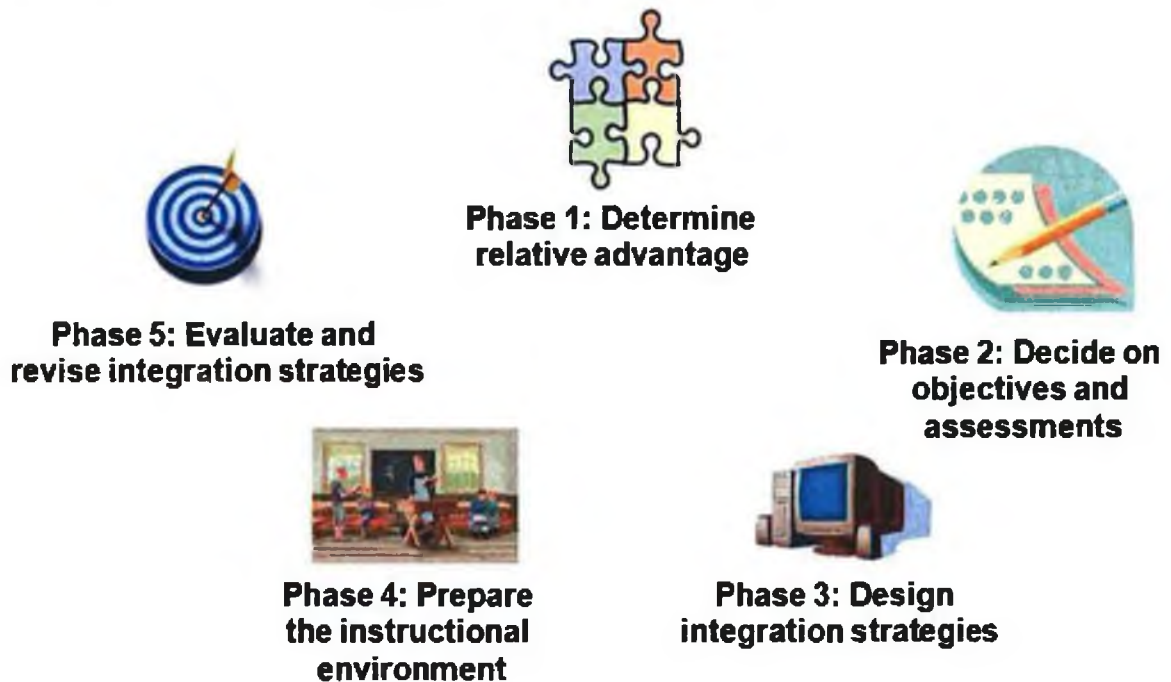
**Phase 3: Design integration strategies**

**Figure 1 (TIP Model)**

- (Roblyer, 2004)

Phases one and five can be applied to technology procurement in any industry that is not education focused. Phases two, three and four are education specific. Generally organisations have their own acquisition and integration processes. The model outlined by Roblyer (2004) is conceptual, it presents the ability to be tailored for an organisations needs.

Technology implementations generally present an array of non-technical and technical challenges. Both Bidgoli (2004) and Rosenberg (2001) argue that return on investment (ROI) and managing expectations are two fundamental non-technical challenges. Rosenberg (2001) goes one step further and outlines the importance of justifying the investment to senior management. Often senior management will only focus on the success of an implementation and areas such as grades improving and cost of maintaining. Usually there are a number of technical challenges that need to be overcome in order for an implementation to be successful, senior management are often unaware of such challenges. "The Majority of vendors today provide an unusually broad array of choice and flexibility within their software as it is delivered. However, there will be times

when your organization's requirements will exceed the software's capabilities. Assuming that your configuration options have been exhausted and that any available workarounds have been explored and deemed unacceptable, your organization's final answer will be to customize the software package." (Starinsky, 2003, p. 216). Allowing software to have such customisation flexibility can lead to unnecessary steps in the implementation process. This increases human error risk, if a software implementation is more complex than it has to be for a particular organisation's requirement then the implementation has greater complexity and there is a heightened opportunity for an incorrect implementation choice to be made. If customisation of software is required then that also adds a risk because the solution then becomes specific to an organisation and may be harder to support and maintain. Bugs that do not exist in the core software solution may be introduced. Enarsson (2006) offers the following "When customising the software, some of the programming code is re-written. The more customised a system becomes, the less able it will be to communicate seamlessly with the systems of suppliers and customers, and the more costly and complex it will be to maintain them." (Enarsson, 2006, p. 140). Emerson's (2006) offerings is coming from a slightly different perspective than Starinsky (2003), the underlining concerns are very closely aligned.

Donaldson and Siegel (2001) outline many other technical challenges when implementing software solutions. They include hardware, security, scalability and infrastructure. These types of challenges are not explicit to learning technology solutions.

A learning management system (LMS) is a common software solution that has been widely adopted in the education industry. "Learning Management System - is commercial software product that enables instructors to provide course materials to students with access to a computer, phone, or handheld device via an internet connection." (Governors State University, 2010). LMSs are used in all three levels of education; they are also commonly used within corporate organisations. Another definition of a LMS is offered by the Centre for Educational Research and Innovation, Organisation for Economic Co-operation

and Development "What is a learning management system (LMS)? In this book, the term LMS refers to software designed to provide a range of administrative and pedagogic services (related to formal education settings e.g. enrolment data, access to electronic course materials, faculty/student interaction, assessment, etc.)." (Centre for Educational Research and Innovation, Organisation for Economic Co-operation and Development, 2005, p. 124). Generally a PC is required to access a LMS. In recent years mobile devices have offered limited LMS features such as digital content browsing. A LMS has four main feature groups. Figure 2 outlines what they are.
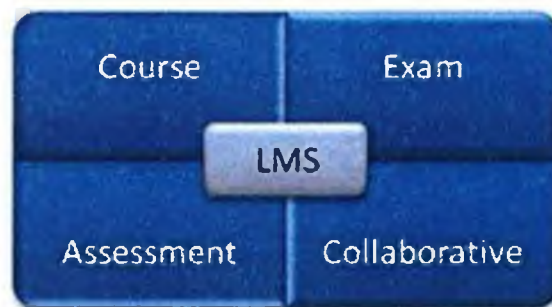


**Figure 2 - LMS Feature Components**

- (El-Ghareeb, 2009)

There is learning solutions that only offer the course feature group, such systems are known as Content Management Systems (CMS). Homework is an example of an assessment function. An end of semester test is an example of an exam group feature. With the emergence of web 2.0 technology collaborative LMS offerings have come to be expected as part of a LMS solution.

The majority of literature reviewed indicates that technology in the learning environment is beneficial to servicing teacher needs and student goals. Toshiba and Microsoft (1997) describe how the hardware strategy that they cosponsored in the late nineteen nineties added value to students and teachers. More recently Norton and Hathaway (2008) outline how new technology such as web 2.0 can vastly increase collaboration amongst students and educators within an educational environment.

The degree that technology in educational environment benefits students depends on a number of factors. The factors include:

- Managing expectation

- How well a system is designed

- Individuals' wiliness to change learning/work practices.

- Investment which is generally associated with ROI

Individuals only get benefit out of technology if they are prepared to invest in it.

The next section outlines a number of out of the box software solutions that may be of benefit to an educational environment.

## 2.3. *Corporate Designed Portal Software Solutions*

While conducting research a number of software solutions were identified that are not specifically designed for an educational environment but initial investigation on the solutions indicated that they may be of benefit in a learning environment. The software solutions identified are:


- Alfresco – is an open source content and document management system

- Documentum - is an enterprise content management platform

- FileNet – is IBMs offering as a content and processes management solution

- Microsoft Office SharePoint Server (MOSS) – Microsoft developed MOSS to be a document management and collaborative portal solution

- Oracle Collaboration Suite (OCS) – OCS is Oracle offering as a collaborative and document management system

- O3spaces – O3spaces has document management offerings

Further investigation reviled that a MOSS based curriculum alignment and collaboration software solution is being widely used in the K-12 learning

environment. There was no evidence of any of the other solutions being used in the K-12 learning environment.

# 3. Research Methodology

This section introduces the research question and outlines the hypothesis in detail. It explains how the research question and hypothesis were conceived. The strategy on how the specific research topic was identified is described. The twofold approach to primary data collection is explained and justified. Sample size and characteristics are introduced along with collection process and measurement strategy.

## *3.1.   Research Question and Hypothesis*

In Chapter 2 there is a wealth of evidence to suggest that a number of learning solutions such as LMSs have been specifically designed for learning environments. Some of them are exclusively developed for different types of environments.

For example, there are LMSs developed solely for use in a corporate environment such as a bank. These types of LMSs design focus could have been on scalability with a view to governance types of digital content. An example is if a government or financial regulator introduced a law in an effort to combat fraud and the requirement is for each employee at the bank to be familiar with the law. Then this could be presented to all employees via the LMS, this may have a strain on the LMS as all employees would more than likely be viewing the digital content at the same time. It would be important that the LMS procured by the bank would have the ability for all employees to use the system at the same time. Chapter 2 outlines Roblyer (2004) mentioning this consideration.

Another example of a learning solution purposely designed for a particular scenario would be a LMS for a third level institution. The focus would more than likely be the availability of digital content and there may not be a strong focus on user permissions to access digital content. This may be in contrast to an LMS that is developed for a K-12 classroom. Generally children's demographic data is sensitive and there is more than likely a strong focus on security and permissions to ensure that children are accessing digital content that is appropriate to their learning goal. Within a third level intuition this may not be the case as third level students generally require access to a vast arrays of digital content.

Although there are LMSs that do cater for all of the mentioned potential situations via configuration or customisation, organisations tend to acquire LMSs that have been purposely designed and developed for their industry or specific need within the industry.

Configuration and customisations of a LMS can add additional time and cost to the acquisition. Even open source LMSs such as Moddle may have significant

time and financial costs involved if familiarity with such a product does not exist within the organisation.

While the research was being conducted a concept was identified. "Would it be possible for a software solution that was primarily developed with non-LMS or non-CMS offerings to have the ability to carry out LMS tasks?" or "Are there organisations that are using products traditionally know as non-LMS or non-CMS as a LMS or CMS?" If so, related system concepts were identified, they included:

- Learning needs addressed

- Leaning needs not addressed

- Perceived advantages

- Perceived advantages

All of the above contributed to formulating a research question. The research question for this study is "To what degree do corporate designed portal software solutions support K-12 learning needs?"

There are three main components to this question. They are outlined and described below:

- Portal software – is generally a piece of software that is the starting point or facade to originations digital resources.

- K-12 – refers to primary and secondary levels of education combined. The term is normally reserved for use in the United States and Canada.

- Degree and Learning needs – these are closely related as servicing learning needs is how the degree factor can be measured.

Chapter 2 outlines the recognition that software such as an LMS is used by education organisations and it accepts that they can add benefit if implemented and used in a correct manner. This has led to primary data collection objectives being identified. They are as follows:

- Discover a portal solution that is being used as a LMS or CMS in a K-12 environment.

- Determine if the solution has perceived advantages and if it has perceived disadvantages.

- Identify if the solution addresses students' learning needs

- Identify if the solution addresses teachers' teaching requirements

The hypothesis for this study is "How effective is e-Learning software designed for a corporate environment by a corporate software vendor in a classroom".

In order for the hypothesis to be proven the following statements must be true.

- The end users of the system, primarily K-12 teachers, are not aware to the fact that the system was not designed specifically to be an LMS and it services the teaching requirements.

- The system has no additional overhead when implementing, supporting and maintaining compared with a traditional learning solution.

## *3.2.   Measurement*

This study measures degree of benefits, benefits cannot be quantitatively reported. Key indicators are identified, discussed and conclusions are outlined. Evidence is then presented that shows whether or not there is support for the dissertation hypothesis.

The next section outlines what strategy was used to identify a system that exists in the K-12 environment and was not specifically designed for to be a learning solution.

## 3.3. Discovery

As outlined in Chapter 1 the researcher for this study is employed by a publishing company called HMH. Within HMH there is a product ownership team; this team are responsible for supplying the customer requirements to the development teams. The researcher was able to identify an individual in the product team that was willing to give an overview of HMH's platform K-12 offerings. During in the overview session a learning solution that is built on MOSS technology was discovered. At the National Education Computing Conference (NECC) 2008 the following was presented "Houghton Mifflin Harcourt Learning Technology (HMHLT) and Microsoft Corp. announced the release of the new Learning Village, built on Microsoft Office SharePoint Server 2007 and the Microsoft .NET Framework 3.0. This teaching and learning portal is a single sign-on solution where educators, students and parents can access and organize their schools' instructional content and learning resources quickly and efficiently." (Micorsoft & Houghton Mifflin Harcourt, 2008).

The HMH website offers the following definition for Learning Village "A powerful curriculum management solution that enhances the teaching and learning experience by connecting educators to the best practices, instructional strategies, lesson plans, and resources that enable measurable student achievement. From one central portal, educators tap into a wealth of web-based curricula, and collaborate in the broader district-wide learning community." (Houghton Mifflin Harcourt, 2010). Further research revealed that Learning Village is a content management and curriculum alignment system that has the ability to digest learning objects such as SCORM; it also offers MOSS out-of-the-box collaboration features. The system is purposely configured for the K-12 environment.

As outlined in Chapter 2 a typical LMS has four key component groups. Within these groups there are a number of features. Figure 3 compares the feature set of a typical LMS (features list provided by El-Ghareed (2009)) and the out-of-the-box offerings of MOSS (features list provided by Microsoft (2010)).

|  | LMS | MOSS |
|---|---|---|
| **Course** | | |
| Course Authoring | x | |
| Course Publishing | x | x |
| Manage course repositories | x | x |
| Track Student Progress | x | |
| Online course | x | x |
| Search tools | x | x |
| *Course management* | x | |
| Add new course to course list | x | x |
| Remove new course from course list | x | x |
| Define course outline | x | x |
| Define course homepage | x | x |
| Define course syllabus | x | x |
| Determine course materials | x | x |
| Define course outline | x | x |
| | | |
| **Exam** | | |
| Grade book | x | |
| Track exams | x | |
| Exam repository | x | x |
| *Answer sheet facility* | x | |
| Spell check | x | x |
| Text to speech | x | |
| Generate Powerful exams | x | |
| Generate different types of questions | x | |
| | | |
| **Assessment** | | |
| Homework submission | x | x |
| Track assessment submission | x | |
| Assessment answers analysis | x | |
| *Answer sheet facility* | x | |
| Spell check | x | x |
| Text to speech | x | |
| Generate different types of assessment | x | |
| Atomised | x | |
| Complex | x | |
| Collaborative | x | x |
| | | |
| **Collaborative** | | |
| Discussion forum | x | x |
| Newsgroup | x | x |
| e-mail system | x | x |

| | | |
|---|---|---|
| Instant message | x | |
| Virtual meetings | x | |
| Simulations | x | |
| Student home page | x | x |
| Blogs | x | x |
| Bookmarking | x | |
| Recommended list | x | x |
| Class list | x | x |
| Notice board | x | x |
| Calendar | x | x |
| Search tools | x | x |

Figure 3 – LMS and MOSS feature compare

Figure 3 indicates that there a number of features that come out-of-the-box with MOSS that are attributes of a typical LMS. Two of the groups that MOSS does not measure well in are exam and assessment. This may be an indication to why the Learning Village solution has content management, curriculum alignment and collaboration offerings.

An individual who works on the HMH product team was able to provide documentation that outlined the Learning Village solution's market penetration. A number of large school districts in the United States had adopted the Learning Village solution. Some of the large schools districts that uses Learning Village includes:

- Bakersfield City in California

- Broward County in Florida

- Detroit City in Michigan

- Guilford County in North Carolina

- Miami-Dade County in Florida

- Palm Beach County in Florida

- State of Georgia

School districts in the United States can be a City, County or State. It depends on how the state wishes to divide the districts. Generally all budgets are controlled at a district level as opposed to a school level. The budgets are required to cater for outgoings such as text book purchases, technology procurements, teacher wages, student transport and general school maintenance. Technology acquirements such as software solutions are normally implemented district wide. This is the case with Learning Village.

The next section describes how an approach for collecting primary data was identified. It will also introduce the key individuals that participated in the primary collection of data.

## 3.4. Approach to Primary Collection of Data

In order to provide evidence that there is support for the dissertation hypothesis a twofold approach is required.

1) There is a need for individuals that are responsible for configuring, implementing, supporting and maintaining to be identified. Once identified primary data needs to be collected in order to provide evidence that there is no additional overhead.

2) Data needs to be collected from the end user population in order to provide evidence for the system's usability.

Pseudonyms names have been created for the individuals that participated in the collection of primary data. The individual working with the HMH product team who was willing to make documentation available as outlined in the previous section is called Mary Jones. Jones's title is "Learning Village" product owner. She is responsible for providing all Learning Village product requirements and oversees all of the marketing aspects of the Learning Village program. She has a five year history with the Learning Village program and has extensive knowledge of who the key Learning Village stakeholders are. In collaboration with Mary a Learning Village hybrid stakeholder analysis was conducted. The analysis primary objective is to identify individuals that can provide valuable inputs to the cost and effort involved in configuring, implementing, supporting and maintaining Learning Village. The analysis differs from a traditional stakeholder analysis. The analysis components are described below:

- Stakeholder- lists the name of the stakeholder

- Stakeholder Interest in Learning Village – identifies the stakeholders role in relation to the Learning Village program

- Area of Learning Village Knowledge – the area of the Learning Village program that the individual can provide inputs on

- Potential Strategies for obtaining support - suggestions on what is the best approach to ensuring the stakeholder participates in the collection of primary data.

Figure 4 shows the completed analysis.

| Stakeholder | Stakeholder Interest in Learning Village | Area of Learning Village Knowledge | Potential Strategies for obtaining support |
|---|---|---|---|
| Paul Gavin | Implementation and support engineer | Implementation, Support and Maintenance | Mary to introduce |
| Frank Connors | VP of strategy and architecture | Development and configuration | John to introduce |
| John Sinnott | Project Manager | Development, configuration and tier 3 support | Contact directly |
| Mark Douglas | Architect | Development and configuration | John to introduce |
| Mary Jones | Product owner | Configuration, Implementation, Support and Maintenance | Contact directly |

Figure 4 -Hybrid stakeholder analysis

High level profiles for each of the stakeholders were identified during the hybrid stakeholder analysis. Please find a description of the profiles below:

Paul Gavin – is a HMH employee based in the United States. He is working off-site and is the primary technical contact for all Learning Village implementations. Paul is also part of the tier two support team and primary client facing technical contact. He has a five year history with the Learning Village program and has worked closely with Mary Jones during that five year period.

Frank Connors – is based in the United States and is a HMH employee. He is responsible and accountable for all development of HMH digital products. He also has ownership of the HMH digital product roadmap.

John Sinnott – is a HMH employee based in Dublin. He has been the principal project manager on the Learning Village program. He has ownership of

development budgets and is responsible for ensuring business requirements are developed within expected time periods. He has had a five year relationship with the Learning Village Program and in that period has worked alongside Mary Jones.

Mark Douglas – Mark is employed by HMH's development vendor. He was ten plus years commercial experience developing education solutions on Microsoft platforms. Five of those years he has been working with SharePoint. Mark is the principal architect on the Learning Village Program.

Mary Jones – Mary is the HMH Learning Village product owner. She is responsible for all marketing aspects of the Learning Village program.

Each stakeholder possesses unique knowledge about the Learning Village solution. In the next section a strategy is outlined for gathering primary data from each individual.

The Learning Village end user population numbers are extremely large. A typical example is the Miami-Dade school district in south Florida, the Miami-Dade school district is one of the largest in the United States. Jones offered the following information when asked how many school does the Miami-Dade school district govern "About 350 schools from age 5 to age 12, and they are typically broken down into elementary which would be age 5 – 11, middle school which would be age 11 – 13 and high school age 14/15 to 18 when they graduate. So typically they would have around 325000 students and 30000 teachers and the related school administrators and district administrators." (Jones, 2010). Jones also added that the majority of the 30000 teachers would use Learning Village on a regular basis. The Miami-Dade school district is a recent Learning Village adopter. Teachers in Guilford County school district in North Carolina are established Learning Village users. In order to get the most meaningful data Guilford County schools District teachers were selected as the data collection participants. The researcher is personal friends with an established middle school teacher that is based in the city of Greensboro. Greensboro is in the Guilford County school district. Heather Wedge Snyder (the teacher based in

Greensboro) agreed to facilitate the collection of primary data from teachers that work at her school. There are roughly fifty teachers that work there.

The twofold primary data collection approach is necessary to explore whether there is support for the dissertation hypothesis. Data collected from the group identified by the hybrid stakeholder analysis will sufficiently address the additional overhead part of the hypothesis. Data collected from the teachers based in Guilford County will provide evidence for the seamless end user part of the hypothesis. The hypothesis may not be fully confirmed or falsified; the opportunity does exist for evidence to be uncovered that partially supports the hypothesis.

The next section describes the methods used to collect primary data. It will also outline the rational for the chosen strategy.

## 3.5. Strategy on Primary Collection of Data

The previous section outlines why a twofold approach is required. The twofold approach does introduce logistical data collection challenges. These challenges are heightened because of the geographic locations that participants reside in.

The preferred method for collecting data from the Learning Village stakeholders is semi-structured face to face interviews. Different stakeholders have unique insight to aspects of the learning system. To ensure that all aspects of the Learning Village solution are accounted for within the interview questions it was necessary to create seven question categories. The question categories and definitions are outlined below.

**Role and product relationship:**

This category was designed to ascertain the interviewees' organisational role and relationship with the SharePoint based product.

**Discovery:**

This category was designed to identify what presence portal designed corporate software solutions have in the K-12 classroom.

**Technology:**

This category will reveal why technically it was decided that portal designed corporate solutions are a good fit for the K-12 classroom. It will also identify advantages and disadvantages from a technical perspective.

**Governance:**

This category was designed to reveal how well positioned portal corporate solutions, specifically the Learning Village solution, are to comply with the education industries process and policies.

**Marketing:**

This category was designed to identify how SharePoint is perceived by K-12 managers and what market risk was involved in moving to the portal solution. It will also outline the reason why a portal solution was chosen.

**Strategy:**

This category was designed to identify the level of reliance on the Microsoft technology and gauge whether the K-12 environment can comply with the reliance on Microsoft product plans and technical roadmaps.

**Learning Needs:**

This category will identify precise educator requirements and student needs. It will specifically expand on what learning needs were outlined in Chapter 2.

Figure 5 shows a category matrix that will ensure that a) the individuals that are participating in the interviews are the best people positioned to do so and b) ensure that the questions created will cover all aspects of the Learning Village program in relation to the hypothesis. Each aspect is covered by two or more roles.

|  | Role and product relationship | Discovery | Technology | Governance | Marketing | Strategy | Learning Needs |
|---|---|---|---|---|---|---|---|
| Paul Gavin | x | x | x |  |  |  |  |
| John Sinnott | x | x |  | x |  |  | x |
| Mary Jones | x | x |  | x | x | x | x |
| Mark Douglas | x |  | x |  |  |  |  |
| Frank Connors | x | x | x |  | x | x | x |

**Figure 5 - Interview Question Category Matrix**

The primary objective of the semi-structured interview is to provide evidence that may support the overhead aspect of the hypothesis, the semi-structured interview

are also intended to provide valuable information that will ensure meaningful questions being presented to teachers. These meaningful questions are required to gather evidence that supports the seamless end user aspect of the hypothesis.

The teachers in the Guilford County School district were presented the questions via an anonymous online survey. This method of data collection overcame logical challenges and enabled the data to be collected in a reasonably short amount of time. The semi-structured interviews were conducted before the online survey, then the data was conceptually analysed, as a result of the data gathered from the interviews and investigation carried out on a typical CMS the survey questions were formulated.

The next two sections describe in detail how the semi-structured interviews and the anonymous online survey were operationalized.

### Interview

The semi-structured interviews were designed this way because a full-structured is too rigid to extract meaningful data from the interviewees. A semi-structure ensured that the required topics got covered during a limited period of time while also catering for any leading or follow-on questions that may be identified during the course of the interview. The order of the interviews was conducted as follows:

- Mary Jones (Learning Village product owner)

- John Sinnott (Learning Village Project Manager)

- Frank Connors (VP of Strategy and Architecture)

- Mark Douglas (Lead Architect on Learning Village)

- Paul Gavin (Implementation and Support Engineer)

The interview with Jones was conducted on the 24th of February 2010 and it lasted 47 minutes. It was recorded on a BlackBerry record feature and was then transcribed to a Microsoft Word document. Please see Appendix A for the full transcribed interview.

Sinnott was interviewed on March the 30th 2010. The interview lasted 55 minutes. It was then transcribed to a Microsoft Word document. Please see Appendix A for the full transcribed interview.

Sinnott introduced the researcher to Connors. The interview with Connors was conducted on Wednesday April the 7th 2010. The interview was recorded using a BlackBerry recording feature. The interview lasted 53 minutes. The interview was then transcribed to a Microsoft Word document. Please see appendix A for the full transcribed interview.

Douglas is based in Grand Rapids in the state of Michigan; as a result the interview had to be conducted over the telephone. The Interview took place on the 14th of April 2010. The HMH conference call system was used to record the interview, this system allows the calls to be saved to a MP3 format. The audio was then transcribed to a Microsoft Word document, the transcription can be found in Appendix A.

Gavin is based in Boston in the United States and the HMH conference system was used to record the interview. The interview took place on the 15th of April 2010. The interview was transcribed to a Microsoft Word document. Please see Appendix A for the transcribed interview.

All interviewees were made fully aware of the objectives of the dissertation and all agreed to be recorded.

Once all interviews were transcribed, the HyperResearch tool was used to analyse the qualitative data collected. The results are presented and discussed in detail in Chapter 4. The HyperResearch tool also assisted in extracting meaningful data that was useful when formulating the survey questions.

All interviewees gave full permission to cite answers.

The next section describes in detail how the survey participants were introduced to the survey. It also outlines how the questions were formulated and how the participants were motivated to complete the online survey.

## Survey

The limesurvey application was used to create and present the anonymous online survey. The National College of Ireland hosts a version of limesurvey. The application is hosed so that anyone on the World Wide Web has access to it. The college allowed for a survey for this study to be set up on it.

The targeted participants of the online survey did not receive any financial incentive for completing the survey. To mitigate the risk of participants becoming disinterested in the survey and not completing it the survey was designed so that it would take between five and ten minutes to complete. The survey has three data collection objectives, they are as follows:

- Gather participants backgrounds and demographics – this was required to understand the educators' teaching experience.

- Gather participants opinions of the Learning Village system – this will capture the teachers satisfaction levels with the Learning Village system.

- Allow the participant to make recommendations – this will identify any strong opinions on the Learning Village system and will identify any functional gaps.

Heather Wedge Snyder was contacted via email on the 4th of April 2010. The email objectives are as follows:

- Make contact

- Outline dissertation background

- Identify if Snyder was willing to facilitate the distribution of the survey

- Communicate timelines and expectations of Snyder's involvement

Following a series of follow-up email correspondence and one phone conversation Snyder agreed to help facilitate the online survey. The school that Snyder works at teaches all grades from K to 12. This will ensure that the data collected has a more realistic representation of the teacher population.

After the initial email exchanges with Snyder is was discovered that the Learning Village solution is known as the Guilford Educational Management System (GEMS). To ensure that all survey participants are familiar with the system Learning Village is referred to as GEMS throughout the survey.

The landing page of the survey introduced the researcher and reasons for the online survey. The dissertation is mentioned. It also reassures the participants that survey is anonymous. The landing page is displayed in Figure 6.



Figure 6 - Survey Landing Page

In order to capture the participants' demographic information five questions were asked. These questions were designed to capture the participants experience and subjects that they teachers. Only one question of the five required text input the others had selection options. Demographic questions are shown in Figure 7.

**Figure 7 - Demographic Survey Questions**

The next twenty one questions were designed to gather teachers' opinions of the Learning Village system. All of these questions made a statement and gave the participant the option to select a choice that is closest to their opinion. These statements were formulated from information that was identified when conducting the LMS/MOSS feature compare and from data gathered from the semi-structured interviews. The questions were designed in this way so that the teacher could give their opinion on all aspects of the system within a short period of time. Opinion focused questions are shown in Figure 8 and 9.

Figure 8 - Opinion Based Questions (a)



Figure 9 - Opinion Based Questions (b)

The next four questions in the survey give the participants the opportunity to make recommendations and to articulate strong opinions. Two of the final questions allowed the participant to enter free text. These questions are non-compulsory. Other questions that relate to the teachers perception of support and maintenance are also asked. Figure 10 and Figure 11 show the recommendation based questions.



Figure 10 - Recommendations Based Questions (a)



Figure 11 - Recommendations Based Questions (b)

The final two questions are designed to gauge the Learning Village solutions reliability and availability. Figure 12 shows the final two questions.
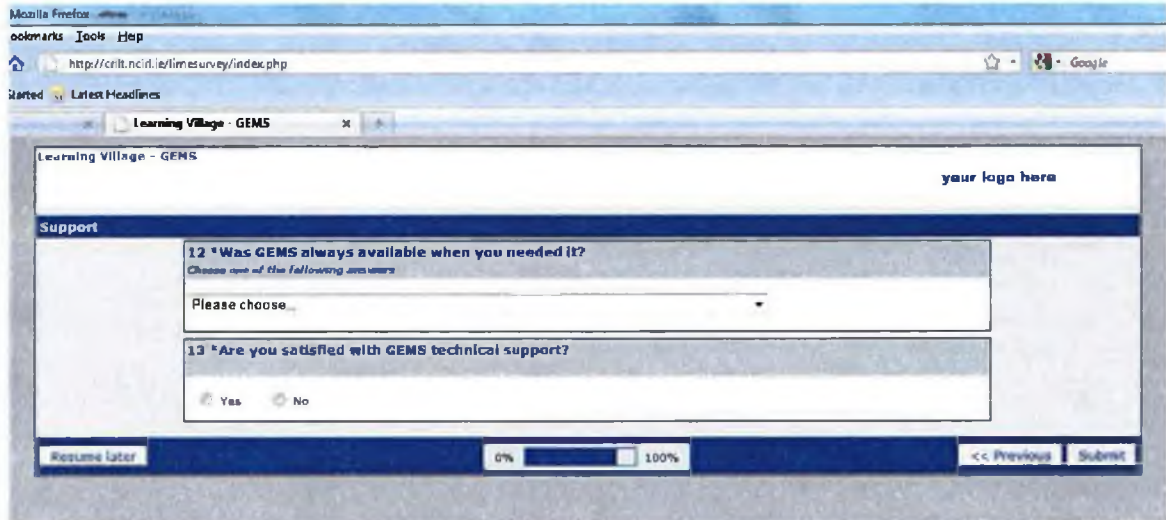


Figure 12 - Reliability and Availability questions

A twofold strategy was used to implement the survey. First of all a draft survey was created and its Uniform Resource Locator (URL) was distributed to three teachers. The three teachers provided very little negative feedback on the pilot questions and as a result no changes to questions were made. The teachers did provide criticism on the online survey's usability and as a result the questions were restructured and were spread out over more web pages. One teacher did have a concern over their identity being recognised and revealed. To mitigate this concern reassuring information guaranteeing anonymity was added to the landing page.

The second stage of the survey implementation required Snyder to email all potential participants. The email contained the following:

- Introduction to the survey

- URL of the survey

- Request to complete the survey

- Expectation of completion time period

- Assurance of anonymity

The email was sent to a total of 43 teachers. 24 teachers successfully completed the full survey. 4 Teachers started the survey but did not complete. The Surveys URL is http://crilt.ncirl.ie/limesurvey/index.php?sid=52313&lang=en.

The next chapter presents the results data collected from the semi-structured interviews and the online survey.

# 4. Results

This chapter presents the results from the primary data collected. It outlines qualitative results gathered from both data collection efforts. Meaningful quotes from interview participants are highlighted, these quotes help prove or disprove the overhead aspect of the hypothesis:

- The system has no additional overhead when implementing, supporting and maintaining compared with a traditional learning solution.

Data from the online survey will be presented and important aspects will be highlighted. This will help provide evidence that does or does not support the seamless end user experience aspect of the hypothesis:

- The end users of the system, primarily K-12 teachers, are seamless to the fact that the system was not designed specifically to be an LMS and it services the teaching requirements.

A total of 43 surveys invites were emailed. The majority of potential participants successfully responded. Please see the percentage break down in Figure 13.

## Survey responses
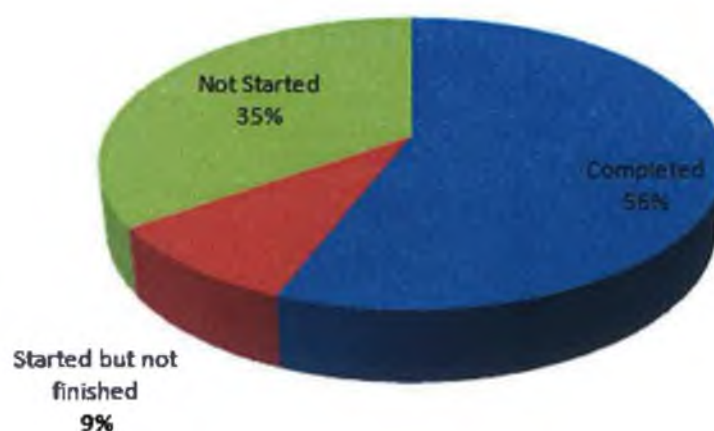


Figure 13 - Survey responses

The chapter will also identify which learning needs have been addressed and which learning needs have not been addressed. Perceived advantages and

disadvantages are outlined. The data sources that these results are drawn from are articulated.

## *4.1. Learning Needs Addressed*

During the interview, Jones was asked whether the Learning Village solution meets teachers' needs. She replied "LV does, but it's not out of the box SharePoint. And this is the value added – why would a district buy all these versus SharePoint itself? Because of all these custom features. We've designed reports, rather than having a SharePoint expert in the districts designs those reports, we've designed the reports to really meet the needs of instruction and curriculum." (Jones, 2010). The answer Jones provided focuses on custom report features that have been delivered as part of the solution she also briefly mentions instruction and curriculum. In Chapter 2 it was identified that curriculum alignment is a core learning requirement for a teacher. When practicing the constructivism learning theory its primary component is to follow on from the previous lesson, each lesson builds on the previous. Learning Village addresses this teaching requirement. Connors reinforces this argument when asked "Would you consider Learning Village a success in the market?" part of his response is "it meets a significant percent of the needs of the teachers, curriculum alignment is a core teacher need" (Connors, 2010). Gavin also strengthens the argument that Learning Village addresses the curriculum alignment requirement; he states "I think probably in a lot of cases it does meet their needs, particularly lessons planning" (Gavin, 2010).

Having a mechanism to present digital content to students has been identified a learning need. Jones (2010) outlines this as one of a teacher's key learning needs. This need is met, when the teachers were asked about viewing content the majority of them use the viewing content feature. Please see Figure 14 for a breakdown of the results:

## Viewing Content (1=Never and 5=Always)
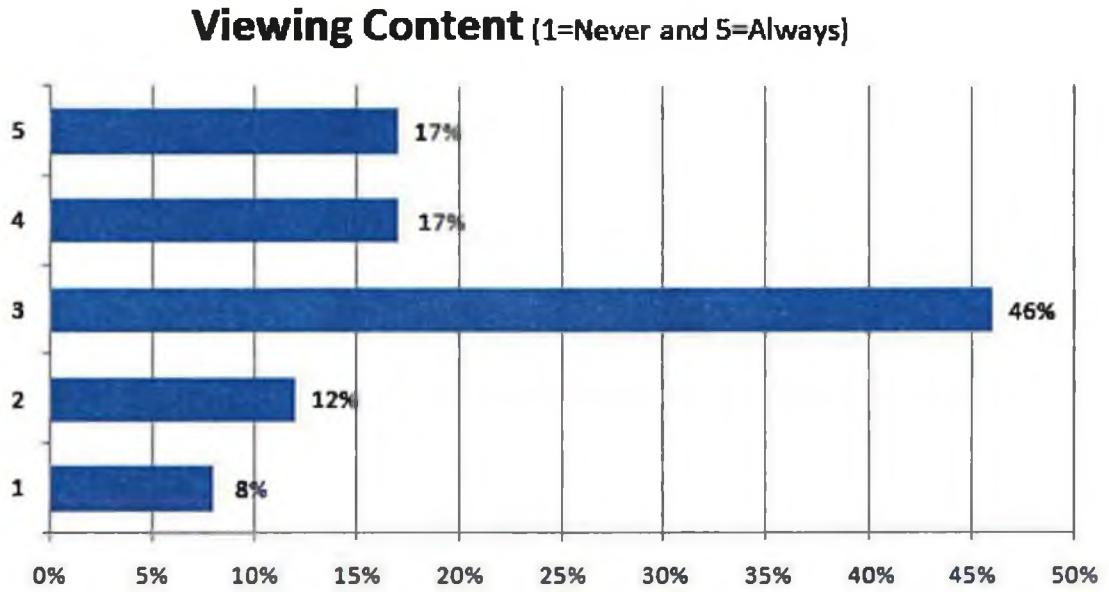
**Figure 14 - Viewing Content feature**

Figure 14 shows that only eight percent of the teachers surveyed have never viewed digital content via the Learning Village solution. The majority of teachers surveyed feel that viewing digital content is of benefit to their students. The results of this question can be seen in Figure 15.

## Benefit Of Viewing Content (1=Least and 5=Most)
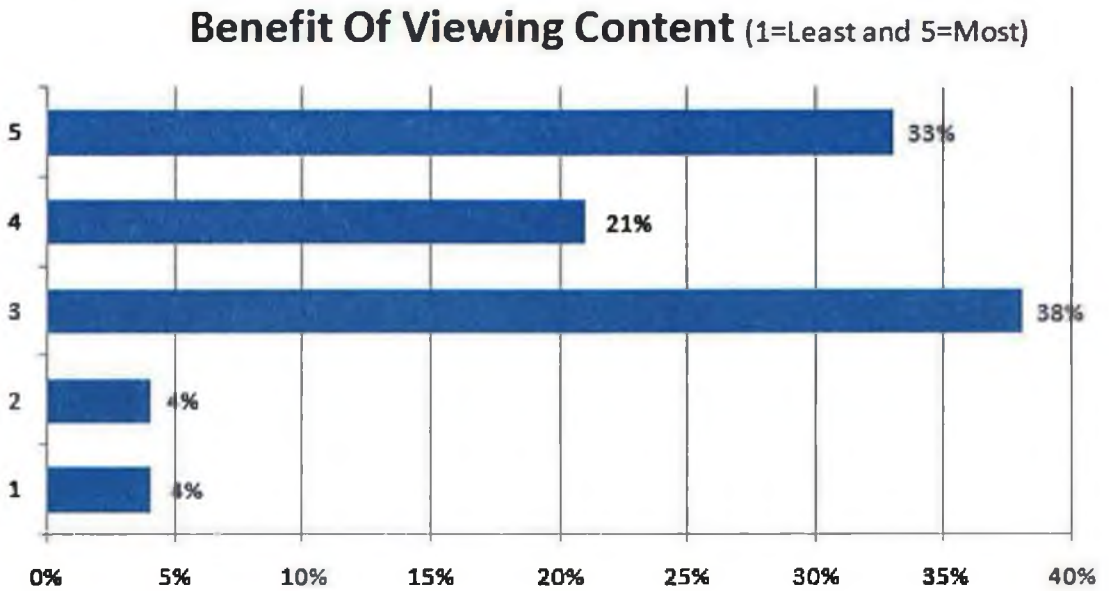
**Figure 15 - Benefit of viewing content**

The main learning needs that the Learning Village solution addresses are:

- Curriculum Alignment

- Content viewing

Both of these needs are expected in a typical CMS or LMS.

The next section identifies learning needs that are not addressed.

## 4.2. Learning Needs not addressed

This section outlines those learning needs that have not been addressed by the Learning Village solution. In order to identify these needs a dual approach was used. In Chapter 2 the study compares the MOSS feature set to those of a typical LMS. Although there are customisations in the Learning Village solution the core features are MOSS based. One key feature set that MOSS (or more specifically the Learning Village solution) does not address are the assessment features. Teachers that completed the Survey were given the opportunity to make recommendations; a number of them recommended online assessment. This is a teaching requirement that Learning Village does not meet. Jones (2010) speaks about the Learning Village solution's roadmap containing assessment and assignment features. Assignment is also a learning need that has not been addressed.

Learning Village as a content authoring tool is not greatly used. Figure 16 show that when teachers participating in the survey were asked about the frequency of content creation the majority of them rarely created content.

## Creating Content (1=Never and 5=Always)
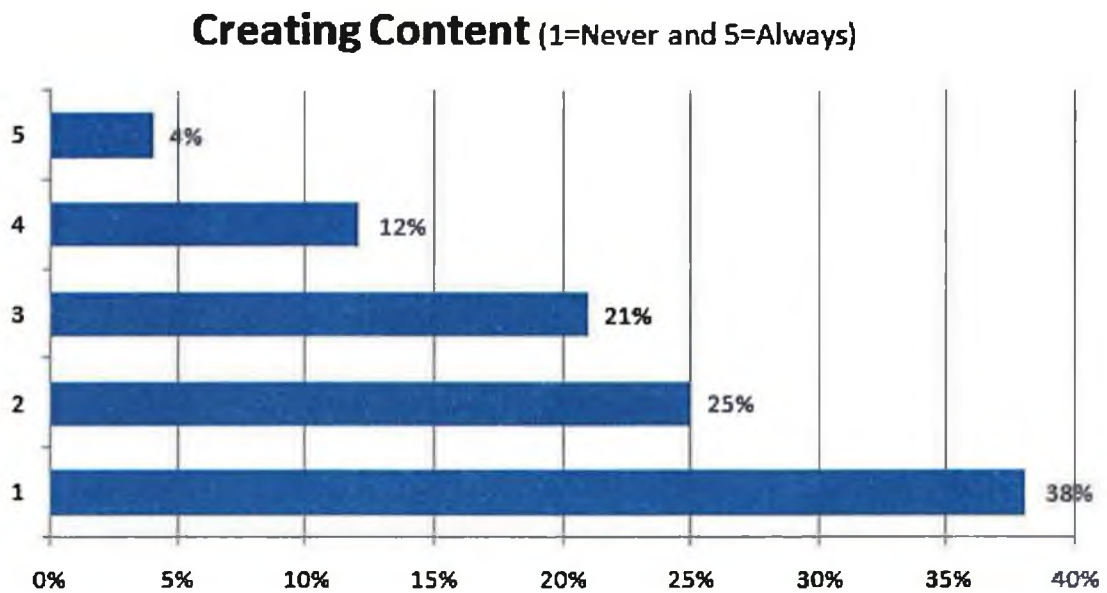


Figure 16 - Creating Content Frequency

Teachers that completed the Survey also voiced their opinion on teaching needs that are not currently being addressed. Some of these items are non-Learning Village related, such items included:

- White Boards or Smart Boards

- Additional computers

- More up-to-date computers

- Additional projectors

There are a number of items that are Learning Village related. Such items include:

- Additional Content

- Additional Lesson Plans

- Learning Village to be more usable

Some of these items mirror the opinions of Jones (2010), Gavin (2010) and Douglas (2010), particularly the usability concerns. Figure 17 shows that the majority of teachers surveyed found it difficult to use the Learning Village System.

## Ease Of Use (1=Diffucult and 5=Easy)
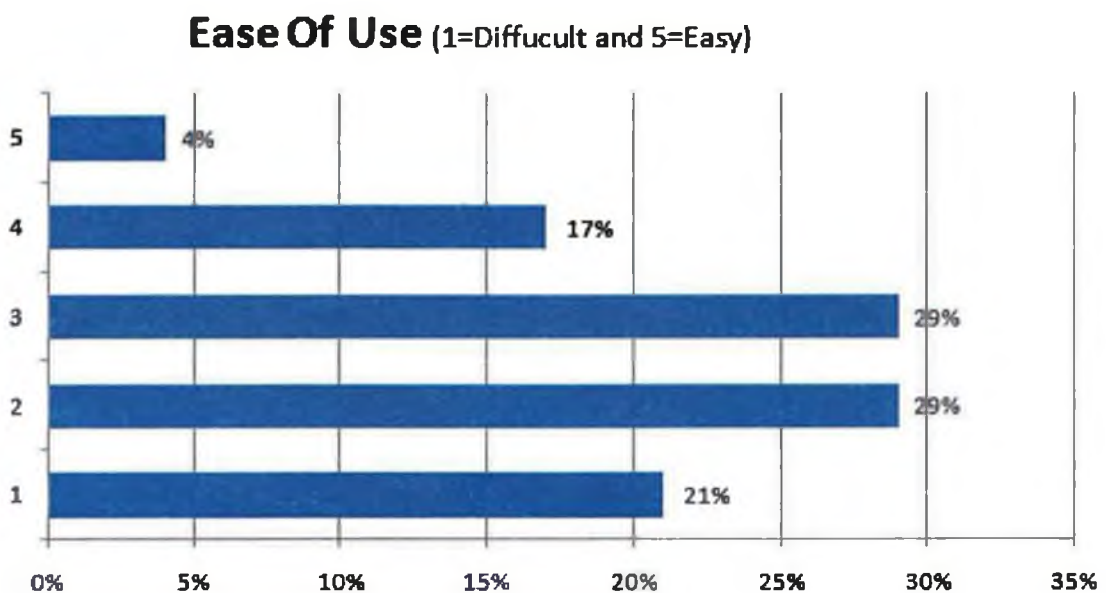


Figure 17 - Usability

A correlation test was conducted to see if there was a relationship between teachers with greater years of experience and the usability. This is required to ascertain if teachers were finding the Learning Village solution difficult to use because of bad user interface design or was it their lack of teaching experience that contributed to the usability concerns. The SPSS statics tool was used to determine if there is a relationship between system usability and years of teaching experience. A bivariate correlation test was run.

$H_0$ = no relationship between usability and years experience

Figure 18 shows the results from the bivariate correlation test.

**Correlations**

|  |  | Experience | EaseOfUse |
|---|---|---|---|
| Experience | Pearson Correlation | 1 | -.192 |
|  | Sig. (2-tailed) |  | .370 |
|  | N | 24 | 24 |
| EaseOfUse | Pearson Correlation | -.192 | 1 |
|  | Sig. (2-tailed) | .370 |  |
|  | N | 24 | 24 |

**Figure 18 - Usability/Experience bivariate correlation result**

The test results show that there is a weak negative correlation (r=-.19, p=.37), so participants with longer experience tended to rate ease of use lower than those with more experience

The next section outlines the perceived advantages that the Learning Village solution offers.

## 4.3. Perceived advantages

Apart from the usability concerns and requests for more features the teachers that were surveyed are relatively satisfied with the Learning Village offerings. The semi-structured interviews reviled perceived advantages that are not transparent to the end user.

When Douglas (2010) was asked about the set of MOSS features being a good fit for a CMS and implementation time he replied "there was a lot of scope involved and the timeline was very tight. And the hope was that the use of SharePoint in the form we chose would provide a significant speed improvement if nothing else, from the point of view of being able to accelerate the development cycle and use some of the out of box features to implement some of the features that were already in the requirement document" (Douglas, 2010). With the tight timelines given and the fact that the solution was delivered within these timelines indicates that the MOSS based product has a quick time to market compared to a solution that is developed solely using a technology such as java, dot NET or PHP. Douglas (2010) expands on his initial answer and makes the following three statements in his answer:

- "So in the grand scheme of things, when the whole thing got said and done, I would break down the components into a couple of categories, one being out of the box – pure out of the box which there wasn't as much as originally intended." (Douglas, 2010)

- "Then you have a whole other section of components that were based on SharePoint functionality as its core infrastructure /functionality but were customized to meet the needs." (Douglas, 2010)

- "Then you've got the 3rd category which was when we completely rolled our own." (Douglas, 2010)

- 61 -

He outlines three categories of development approaches. They are:

- Pure Out-Of-The-Box SharePoint

- Customised  Out-Of-The-Box SharePoint

- Pure Customised features

Douglas (2010) revealed that the percentage ratios of features in the Learning Village solution are 10% (Pure Out-Of-The-Box SharePoint), 80% (Customised Out-Of-The-Box SharePoint) and 10% (Pure Customised features). The acceleration of the product development times is due to 90% of the features being delivered are based on SharePoint Out-Of-The-Box. Sinnott (2010) reinforces the speed to market argument and states that there were "obvious quick wins" (Sinnott, 2010) when it came to selecting MOSS as the framework to build Learning Village on. Sinnott (2010) also makes reference to a cross reference of MOSS features against the MOSS offerings. When Sinnott (2010) was asked about time to market being reduced he makes a direct statement, "We couldn't have built it from the ground up. Not with the time pressure we had, we started production on the 21st January, and we were complete, and had passed testing it and had secured the key stakeholders on the 11th July. And it was done mainly by lifting key features from SharePoint." (Sinnott, 2010).

Chapter 2 outlined a typical model for acquiring technology such as Learning Village; Chapter 3 alludes to how school districts host their technology. Generally web based solutions are hosted centrally and managed from a central location. Jones (2010) describes this model in detail. Any system that is purchased would have to be able to cater for the required number of end users. When Connors (2010) was asked about what else besides features does MOSS bring to the table he replied "Scalability, the fact that SharePoint can scale to one million users with relative ease was a big plus. If you think of some of the big school districts like Miami-Dade or Broward, they have 350,000 plus students in their districts. If you throw in teachers and parents that could bring to user number to over one million. Given that district central host their application the portal offering that SharePoint is a big plus." (Connors, 2010). The fact that MOSS is

architected to scale to such numbers is another perceived advantage that the end user may not be aware off. Douglas's (2010) opinion is in line with Connors's. When he was asked about providing justification for MOSS to be used as a CMS he replied "Its ability to integrate with user directories, this enhances user security. This is important as often student profiles are more sensitive than adults. SharePoint also scales very well, even though we make a good number of customizations, the underlying framework is the same and nothing was introduced that would have a negative effect on SharePoint's ability to scale." (Douglas, 2010). Of all the individuals that were interviewed Connors and Douglas have the most insight to the underlining MOSS technology. They both agree that the MOSS saleability offerings are an advantage when developing and implementing the Learning Village solution.

Some educational organisations opt for open source solutions; this is discussed in Chapter 2. With Microsoft being a corporate software vendor the question was asked to Jones (2010) if she thought the Microsoft name associated with Learning Village is positive or negative. "I think it gets us in the door of a lot of places that we aimed to get in the door before but couldn't. A lot of the technology decision makers in school districts like Microsoft because they are familiar with the products and generally causes them less pain." (Jones, 2010). From a marketing and opportunity to sell perspective the Microsoft name being associated with the Learning Village solution appears to be positive. Connors (2010) states that the partnership with Microsoft has the added advantage of Microsoft being responsible for fixing MOSS related bugs. This has the advantage of a robust solution being provided as bugs can be reported from wide market place not just users that use the Learning Village solution.

The next section presents perceived disadvantages of the Learning Village solution.

## 4.4. Perceived disadvantages

The previous section outlined the potential for the Microsoft brand to be a perceived advantage. The fact that the Microsoft name has the potential to reach new customers and that Microsoft may fix MOSS related bugs are two positive aspects of the Microsoft and HMH partnership. Microsoft charges for the vast majority of its software products. There is a free version of SharePoint available in the form of Windows SharePoint Services (WSS); Douglas (2010) mentions this. WSS did not meet the Learning Village requirement. According to Jones (2010) Learning Village is built on a licensed version of SharePoint. Douglas (2010) reveals that it is MOSS standard edition. When Jones is questioned about the licence fee she replies "The cost is mostly passed on to the district. Microsoft does give us a special rate because of the strategic partnership. But the cost is still quite a large amount compared with some applications that have been built from the ground up." (Jones, 2010). Although the end user may not be directly affected by the cost of the solution, the potential does exist for this additional cost to impact other prospective procurements.

The initial Learning Village district installations appear to be complex. "I would say LV is one of the most fiddly installs we do, because it is so tied into how the district does things. For example an LMS install requires a single user account to run. LV requires at least 11 accounts so right there you've huge administrative overheads which we foist off on the district, but at the same time, because of the extra complexity involved, it makes it more likely that there's going to be a problem. Also a lot of the steps in LV are very manual which is a problem, because the more manual steps you have the more likely things are to screw up." (Gavin, 2010). Gavin (2010) explains the level of complexity involved while installing the Learning Village solution. When asked how this compares with other software platform installations, Gavin (2010) mentions that the Learning Village installation is a more complex process. He suspects that this is mainly due to MOSS as opposed to any aspects of the system that have been customised. Connors (2010) recognises that MOSS does scale well but a great deal of preparation is required to fully define what network farm topology is

required for a specific district. This can be a "costly endeavour" (Connors, 2010). The complexity and length of time required to install the Learning Village solution can potentially negatively impact a learning environment as the system may be unavailable.

The time required to migrate data and provide maintenance is large. "Data migrations have been time consuming and complex. For example, if a new version of LV is released then best practice dictates that all data must be backed up, this is a complex process. Not like a regular SQL data backup. In fact if any type of LV maintenance is required it generally takes a long time and can require onsite visits." (Gavin, 2010).

Gavin's comments are in line with teachers experiences. Figure 19 shows the percentage of teachers that have been impacted by the GEMS system in Guilford County not being available.

## GEMS Availability



- Yes, it was always available - 54%

- The GEMS server was not available on one or more occasion, but it did not affect my work - 42%

- The GEMS server was not available on one or more occasion and it did affect my work - 4%
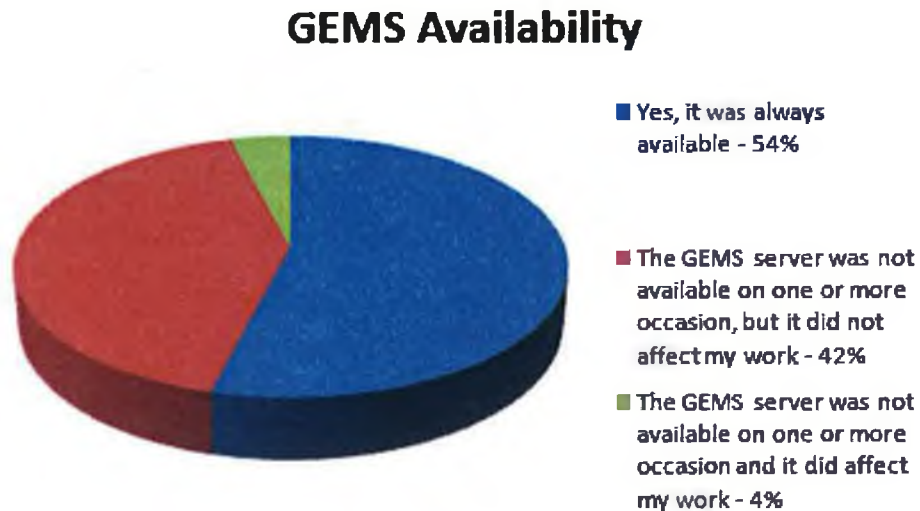
Figure 19 - GEMS Availability

The impact is not a majority but is higher than expected compared with a typical software learning tool.

According to Gavin (2010) support challenges exist as the Learning Village product needs to be in line with Microsoft's MOSS support policies. For example when Microsoft released MOSS Services Pack (SP) 2, SP 1 was only supported

for one year after the release date of SP 2. This has the effect of Learning Village installations that are in districts requiring an upgrade to SP 2. That may be perceived as a disadvantage as such a task is complex and time consuming.

When teachers surveyed were asked about what improvements could be made to the system, user experience related feedback included:

- "Faster"

- "Easier to navigate"

- "It is very difficult to access information that is needed. I also find the organization of the information confusing"

The survey did not identify any positive comments on the user interface (UI) or user experience (UX). Gavin also outlines a negative opinion on the UI by saying "I think that LV suffers from inconsistency of user interface across the product." (Gavin, 2010).

According to Connors (2010) and Sinnott (2010) it was difficult to find a development vendor that had MOSS development experience. When Connors was specifically asked about sourcing a development resource he replied "I think that was a learning experience for us, all the buzz around what SharePoint could offer us was very compelling in drawing us to it as a platform for development. Once we went to look for partners that we could outsource the development to was very challenging." (Connors, 2010). Because of the concept of supply and demand experienced MOSS developers came at a high cost. This high cost has the potential to be passed on to the district and may have an effect on the learning environments resources. The lack of skill set availability may also have an effect on support as well development.

The next section discusses where the data is drawn from.

## *4.5.   Data Sources*

The data that helped report learning needs addressed, learning needs not addressed, perceived advantages and perceived disadvantages are primarily based on interviewee's opinions. The range of categories that the interviews covered is outlined in Chapter 3. Specific questions were then asked in the anonymous survey with a view to reinforce the interviewee's opinions. This proved to be the case in the majority of instances. A number of tools were used to help analyse the data collected. They include:

- Microsoft Excel

- SPSS

- HyperResearch

The initial opinions were formulated from the semi-structured interviews. The online survey reinforced opinions. This allows the study to communicate more accurate results as opposed to gathering data from one primary source.

# 5. Discussion

The twofold data collection approach offered the opportunity to validate and cross reference opinions and conclusions. Very few contradicting statements were identified; this strengthens the validity of the study. There are some conflicting opinions from Connors (2010) and Gavin (2010). Connors (2010) cites the MOSS skill sets as a major challenge for the development of the Learning Village Solution and its ongoing support and maintenance. He talks about the difficulty in finding a development vendor and its expense. "This was one of the first ones were we tried to use a more agile methodology but one of the constraints that we faced was that our project management team was set up in a more traditional and more waterfall iterative approach. So one of the key challenges was to develop a hybrid model were we would still develop in an agile way but where there were key milestones we could reach, and checkpoints where we could say 'yes we've achieved this' and that was also aligned with how we reported back to Microsoft on where we'd gotten with our development schedule given that they were sponsoring the development of this. So it was a combination really of what I'd call a hybrid agile model." (Connors, 2010). Having to create a hybrid development model so that the product could be developed is not ideal. Gavin (2010) cites the complexity of the MOSS product as the main challenging factor. Connors (2010) as the VP of strategy and architecture would have a conceptual understanding of the MOSS technology were Gavin (2010) as a field engineer would be closer to the low level details of the MOSS technology. Perhaps it is not surprising that their opinions on the Learning Village challenges differ slightly. Douglas (2010) appears to have a good understanding of the conceptual and low level MOSS technology. His role as lead Learning Village architect requires that he does have that level of understanding. Douglas (2010) cites feature challenges as the biggest obstacle. "Well the big challenge with the calendar was well when the requirements were originally identified we expected to use the out of the box calendar functionality. However when we got into the real requirements that the product manager and the business analyst were really

talking about they were not really so much a traditional calendar." (Douglas, 2010). The calendar was considered an out-of-the-box MOSS feature but when it was time to implement that feature the out-of-the-box MOSS offering did not meet the requirement and a custom calendar feature had to be developed. Both Connors (2010) and Douglas (2010) make reference to the general perception of out-of-the-box features. Non-technical individuals expected that the out-of-the-box feature would simply meet the business requirement once enabled, this proved not to be the case and in many instances additional work was required to ensure the requirement was met.

The product's short time to market is one aspect that all five interviewees agree was impressive. This is despite the vendor selection and development methodologies challenges that are outlined by Connors (2010) and Sinnott (2010). This would have impressed Jones (2010) as her main objective is to provide a product that meets the learning technology needs of school districts.

The MOSS skill set is an issue in development and support. The development challenges have been identified and discussed in Chapter 4 and earlier in this section. "Ideally we would like to push it back to the engineers who developed it, because we don't have the visibility into how the product was developed, in order to discuss with another vendor like Microsoft, so because we don't have enough info to see what's going on , it's not really something we can open tickets on." (Gavin, 2010). Field engineers appear to be unable to diagnose system issues. This may be because the skill set does not exist or it may be down to the complexity of MOSS.

There was mixed reaction amongst the surveyed teachers when it came to opinions on Learning Village's collaborative offerings. Some rarely used features such as discussion boards and news items while others used them frequently. The mix is across the board. Jones's (2010) perception is that the collaborative offerings have been well received in the school district. "The districts are impressed by the systems collaborative offerings." (2010). Perhaps the school districts management teams view the Learning Village collaborative offering as

features that have the potential to be useful but that has not filtered down to the end users. Or perhaps the teachers only want to use Learning Village as a curriculum alignment tool and would prefer to collaborate using more traditional means such as face to face or email.

Opinions on the user Interface and the overall user experience are mainly negative.

There was very little negative opinion on Learning Village as a curriculum alignment and content management tool. Most of the opinions in the area are positive. There were a number of teacher requests for more content to be made available. Such requests are not to be considered negative about the Learning Village solution.

The next chapter makes conclusions from the items discussed in this chapter. It also outlines recommendations that may improve SharePoint technology in a K-12 learning environment.

# 6. Conclusions and Recommendations

As started from the outset the purpose of this study is twofold.

a) The end users of the system, primarily K-12 teachers, are seamless to the fact that the system was not designed specifically to be an LMS and it services the teaching requirements.

b) The system has no additional overhead when implementing, supporting and maintaining compared with a traditional learning solution.

The primary data source that will ultimately identify evidence relating to hypothesis (a) is the anonymous online survey. Although the large proportion of the teachers surveyed did voice some negative opinions such as "more content" and "additional hardware" none of the negative opinions are directly related to the Learning Village solution. These opinions would exist if the Learning Village solution was custom build. The "more content" opinion is simply a case of not enough content being loaded into the Learning Village solution. Again this scenario would more than likely exist if the solution was custom developed. The core curriculum alignment and content management features are frequently used and the majority of teachers do feel that these features add benefit to the K-12 learning environment. When the teachers were asked directly if the Learning Village solution satisfies their technology teaching needs the majority said that it does. Chapter 5 outlines user experience concerns. This is more than likely because of the aggressive development timelines as opposed to MOSS's ability to present an enhanced user experience. "I mean there are members of the development team that are strong when it comes to UX design and SQL server. But we didn't have individuals that were solely focused in those areas. I think we have enough SQL depth in the team to have covered all the SQL concerns. It is a very senior dev team. In hindsight we probably could have used a dedicated UX expert. I mean, MOSS isn't that difficult to skin and the underlining MOSS technology is just dot net, but wireframes presented to developers would have been useful." (Douglas, 2010). Douglas (2010) indicates that additional usability

expertise would have been of benefit while developing the Learning Village solution. This logic can be applied to a custom developed solution. Any solution that is developed under time pressures is more than likely going to fall short in some area, in the case of the Learning Village solution it appears that it is the usability that suffered. Over all the time allowed to develop the Learning Village solution appears to have been too aggressive. Additional time should have been allowed to cater for the usability concerns or some features should have postponed allowing time to focus on the UX design. K-12 students have specific UI requirements, especially the younger ones. MOSS is primarily designed for a corporate environment with adults being the targeted end user. The magnitude of this gap was not taken into consideration, it is recommended that UX experts evaluate the current system and outline proposed UI changes. It is also recommended that a process is established that gives the end user the ability to provide UX related feedback that will go towards improving the systems usability in future releases. End user surveys is one method that could provide feedback, this method may not be the most efficient technique as it may difficult for a user to articulate UX recommendations in the form of a survey. The setting up of usability labs would more than likely provide meaningful feedback. Users could be invited to participate is such labs; while they are carrying out their usual system tasks they could be observed. Problem areas such as a user clicking many times to navigate to a particular area could be recorded and feedback be given to design experts so that such problem areas are addressed. Involving educators in the design is another method for ensuring that future releases address the systems UX issues.

All of the outlined indicators prove that the teachers are unaware that the underlining technology of Learning Village is MOSS. They are unaware of a portal solution existing in the K-12 classroom. The results support Hypothesis (a).

The primary data source that will ultimately identify evidence relating to hypothesis (b) is the semi structured interviews. Four of the five interviewees were asked if the clock was rolled back would SharePoint be selected as the technology to be used for the Learning Village Solution. The responses include:

- "If I look back at it now and I look at the timing of it, I'm not sure if SharePoint was mature enough for what we wanted to do with this at the time. But again it ties into the fact that as a company we didn't really know what we wanted it to be ultimately and we didn't anticipate that it would grow as quickly as it has. So looking back it's easy to say it may not have been the best solution, but at the same time it got us a product to market very quickly. There are pros and cons to the argument, and we've suffered through some difficult times for having gone with SharePoint and the fact that the customer uptake has been more than we thought. So I think we could look back and question whether it was ideally the right approach. I think if we were to start the project now, I would think the portal approach is still a good one and I think that space is more mature now, so I think if we were starting it now we would definitely use SharePoint, if we were to look back and we say if we had a runway of 3 years before this was really going to take off and we knew that then SharePoint would have been the right decision, but given where we are today, and we do face some challenges, I think it's one that we would have to seriously think about" (Connors, 2010)

- "It would be a difficult decision. A lot would depend on the time. Given the same amount of time that we had, and starting it right now, I would probably use SharePoint but in a far different manner than what it is today. I think that's probably the best answer I can give. It definitely would have been radically different than what it is today, but SharePoint would have been used at some level." (Douglas, 2010)

- "I would not use SharePoint. That was the argument that I had 3 years ago, and I would stay with that argument. And I will say that I don't have visibility to how much smoother the development process is, how much easier it is from the development side, I just see the increased complexity in deployment, and I see the perceived increased slowness on releases. I actually think that the best model we have out there for any of our

products is something like Aerobics, which we drop as a black box into a district, and we configure it and that's it!" (Gavin, 2010)

- "Would I recommend? Going forward? Absolutely no way, you need to own your own code from a licence perspective and a road map perspective you can't be relying on a 3rd party." (Sinnott, 2010)

Some of the responses are more diplomatic then others, in general MOSS would not be selected as the underlying technology for the Learning Village solution. The reasons for this are outlined in Chapter 5, they include:

- Rightness of feature set

- Reliance on Microsoft

- Difficult to support due to complexity of solution

- Time consuming maintenance

- Shortage of skill set

All indicators gathered from the semi structured interviews suggest that hypothesis (b) cannot be supported.

In conclusion the finding of this study shows that corporate software does support K-12 learning needs to a novice degree. Although the teachers are unaware to the fact that the Learning Village solution was developed on the SharePoint platform and in general they believe that the solution is of benefit to them and their students they are probably unaware of the effort involved to ensure that they have a meaningful system. The effort required has high resource overheads and is costly. This combined with the additional licences cost that appear to be passed on to the customer have the potential to drain K-12 school districts budgets. Jones (2010) explains how the school districts budgets are funded and are fixed on a yearly basis. When a school district purchases the Learning Village solution it lessens the district's ability to acquire other technology resources. The MOSS based product in itself does add value but there is an additional underlining cost to the K-12 learning environment.

The primary recommendation is for school districts to lessen their investment in portal corporate software solutions and focus investment on custom systems that are designed specifically for an educational environment.

School districts that use the Learning Village solution have the infrastructure to host portal solutions. This study produces evidence to suggest that MOSS does scale well. One prospect worth investigating is how feasible would it be for the current infrastructure to host a custom built solution. Custom built solutions that are built on technology such as dot NET, Java, PHP, SQL Server and Oracle have the ability to be split up into different components so that the components can be hosted on different tiers of a network farm topology. This promotes such solutions scaling well and as a result can cater for more end user numbers and solution traffic. It is recommended that the concept of a custom built solution being hosted on infrastructure that was primarily procured for portal technology is explored further.

The next chapter expands on the primary recommendation and identifies future investigations.

# 7. Future Prospects

The research for this study focuses very much in the Learning Village solution. After concluding discovery on such solutions, the Learning Village solution was identified as the only K-12 learning tool that is developed by a corporate software vendor that has market penetration.

There are a number of future investigations that should follow on from this study. Four primary investigations are outlined below:

### Full Impact Analyses

A full end to end impact analyses should be conducted. Chapter 6 outlines the potential for districts technology budgets to be impacted by unnecessary costs associated with Learning Village being passed on to the district. Investigation should be carried out that measures the true impact this has on the K-12 learning environment. Although different districts have different budget strategies an investigation approach should be designed with a view to the investigation measuring the full impact. When this is complete the Learning Village solutions true value can be identified.

### Microsoft Future Releases

This study outlines the reliance the Learning Village solution has on SharePoint technology. Microsoft has released a number of MOSS 2007 service packs and some MOSS updates. The Learning Village solution needs to cater for such updates. The custom enhancements that have been built on MOSS features may be impacted by such releases. A strategy needs to be put in place to ensure that such impacts are kept to a minimum. Since investigations for this study started, Microsoft has released the next generation SharePoint, MOSS 2010. MOSS 2007 will be supported for the near future but Microsoft will be encouraging upgrades to MOSS 2010 and eventually MOSS 2007 will no longer be supported by Microsoft. Given the complexity of the Learning Village solution upgrading will

more than likely be time consuming and costly process. Investigation should be conducted that will determine if it is justified to continue using MOSS technology or if investigating in a more custom built solution would be a more appropriate way to proceed.

**Personalisation**

Rosenberg (2009) discusses the potential for system personalisation. Personalisation is when a software solution recognises the end user and can better cater for their learning needs. He points out that to date there are many reasons to why eLearning software solutions have not been personalised. He cites that up until now technology has not had the ability to cater for personalisation. MOSS offers a feature that enables the end user to have a personal web site. Currently this feature is not enabled in the Learning Village solution; the potential may exist for this feature to work well with system personalisation. An investigation should be conducted to see if such a feature can be used for system personalisation.

**Skill Set**

Both (Connors, 2010) and (Gavin, 2010) argue that the lack of SharePoint skill set has been challenging. The reasons for this are twofold:

- The technology is relatively new and the development and support market has not had the time to fully embrace the technology.

- The technology is so complex that individuals find it difficult to understand.

An investigation should be carried out to establish which of these reasons is creating the skill set challenge. The latter may be more difficult to overcome and if this is proven to be the reason for the lack of SharePoint skill set then that may be further justification for portal corporate solutions not being used in the K-12 learning environment.

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# Appendices

## *Appendix A: Interviews*

**Interviewee:** Frank Connors

**Title:** Learning Village CMS background

**Interviewer:** Eoin Murphy

**Date:** 7 April 2010

*Could you please identify your role within HMH?*

My current role which has changed as you know, I'm the VP of technology strategy, so essentially it's a forward looking role, where I'm looking at what sort of technologies that we as a company should be using. I'm looking at where the market is going, and how that aligns with our product road maps, and then essentially making sure that they converge, looking at where we need to go, how we're going to get there, what technologies we should use. And prior to that the role title was technology strategy and architecture, heading up the entire development team, so it's changed a bit in focus, but in terms of the role itself it's still heavily involved in providing direction to the development team, managing the team specifically rather than meeting the needs within the team, but it's still very much engineering focused.

*What needs to happen to SharePoint to turn from an off the shelf product into a learning village application?*

LV was formerly a product that was very popular but it was a local install and there were pockets of users, but if you look at it overall it wouldn't have been a

mainstay product for us, but I suppose there was a growing trend, so one of the key things is that it was an older product and it needed a complete re-write. So that was the foundation of how we started looking at how do we go about it? So what happened was – it was almost coincidental – Microsoft were looking to partner with someone within the education space, because it's one of the areas that they hadn't a strong foothold and its one of the areas that they felt was a growing segment, so it's through our relationship with them, primarily through some of our sales folks that we struck up this conversation with them around how could we collaborate on a product that would be mutually beneficial for both of us.  So there was a number of demonstrations by Microsoft on what SharePoint technology would fill, it was an early version 2003 back then, and they were showing what would come in 2007 and it had taken off in terms of its penetration in the educational sector, there was actually a lot of companies that were starting to grow businesses creating solutions that could be delivered in the educational space. Now as a product it's not really specifically designed for it, but it lends itself very well in terms of the out of the box features that came with SharePoint, where things that we as technology teams working in educational space had to develop ourselves. So in looking at what it offered, really in terms of a vetting process (and I wasn't really fully involved in that aspect of it) but it came down to Microsoft demonstrating a) what SharePoint could offer us from a set of technologies and how it could deliver on 80% of the core things, and then it's the finesse of LV in this instance – that's the piece  we would build on top of it, but we'd get 80% of stuff out of the box, and it was really that which formed the basis of moving forward . and given the fact that historically it was an application that didn't have massive usage, things like scalability of the solution or longevity of it etc weren't huge factors, because really it wasn't intended to be used that way or wasn't up to that point. But Microsoft certainly touted the technology and the strength of the technology as being something that would grow with us, I suppose was the way they pitched it.

So it was really a collaboration that grew out of a sales relationship and that then came into the technology world and one of the key things that cemented that

relationship, was that Microsoft were picking Riverdeep at the time (HMH) as their premier partner in the education space, and that at the time was a huge win for us as a company because there are so many competitors and large competitors that didn't get that. So given the power of the Microsoft brand etc I think HMH were willing to take a chance on the technology given what they'd seen, and also the fact that Microsoft sponsored significantly the costs of the initial development. So it was a win win for us in that we were going to be able to replace the legacy with something new, we were going to be able to get it to market very quickly because you're getting all the stuff out of the box and as a technology it certainly seemed to tick all the boxes.

*Was the development approached in the same manner as the traditional development projects?*

No, purely because it's such a feature this platform, and a lot of it was looking at what the platform offered to ensure we were maximising the out of the box platform features. So in a traditional project you're going through a whole alliterative process to design exactly what you need to build out, creating the entire detailed requirement documents etc. With SharePoint you're looking at what you get out of the box, and then going beyond that, what layer are we creating on top of it?

So the piece that we developed ourselves followed more of a traditional model, but then there were all the SharePoint pieces which required us as a team to really ramp up just even from an understanding perspective what it offered which is really quite different...say for example you're bringing in Vanilla.net programmers, it's a different process there because they've got already the key field under their belt, and really it's about how do we design this product, or this platform that we're developing. Whereas with SharePoint it's a different process, because you're wanting to utilise as many things as possible that come with SharePoint itself, and then looking at how do you build your layer on top of that.

*Features lost on new system...was SharePoint able to cater for those?*

As far as I know yes, I think the existing product was quite basic and from a UI perspective was quite archaic and had a lot of issues. So the features that came with SharePoint far outstripped what came with the original product. So if something was lost and I'm not sure if it was, the amount of stuff that they gained would have overshadowed it completely so from a customer perspective it wouldn't have had any negative impact. And certainly the feedback from our customers has been very positive and I haven't heard anyone say that they miss something that was in the original product.

*In the development cycle, what methodology was used?*

This was one of the first ones were we tried to use a more agile methodology but one of the constraints that we faced was that our project management team was set up in a more traditional and more waterfall iterative approach.

So one of the key challenges was to develop a hybrid model where we would still develop in an agile way but where there were key of milestones we could reach, and checkpoints where we could say 'yes we've achieved this' and that was also aligned with how we reported back to Microsoft on where we'd gotten with our development schedule given that they were sponsoring the development of this. So it was a combination really of what I'd call a hybrid agile model.

*So the development model would that be developed in HMH or outsourced*

It's very much outsourced, I think the culture here is to embrace the outsourced model completely, so I think from the get go our approach would have been to

have a single lead internally manage the entire project. And I think this is an approach that has grown over many years, and there isn't a one size fits all approach to how you look at development in an outsourced model and it's something we've tweaked over time in terms of the profile of the team we outsource to, and the number of leads we have internally given the number of streams we run and so I think that that model has grown with us but definitely outsourcing would be a key mantra in our company.

*Did you have any challenges finding a partner when going to market?*

I think that was a learning experience for us, all the buzz around what SharePoint could offer us was very compelling in drawing us to it as a platform for development

Once we went to look for partners that we could outsource the development to was very challenging, and as you may recall the whole initial outsourcing model was a bit of a disaster given that we went to the partners that Microsoft recommended and we took for granted that if Microsoft recommended them they were probably very good, and gauged them for a number of months and I think we were very disappointed in how they were performing which resulted in us pulling the project from them and essentially restarting it. So I think again we learned as a company that a) going with a brand new technology and b) going with a recommendation from a partner such as Microsoft assuming that if they are recommended they must be good, I think we got burned for it on both fronts and we're wiser for it now. So it was good in the long run, and we were able to intervene early enough for it to be successful, and to pull back and in fact making the decision to , when we switched partners, to go back to the drawing board and throw away what we had done was the right decision to make. But certainly I think that it's a challenge and even to this day I think we both acknowledge it's still a challenge.

*"Able to get this out the door quicker." Was that due to out of box features you were able to utilise?*

Yes that was one of the key drivers there. If you look at how rich the LV application is, that is a multiyear project to get that out of the door even in a basic form, so even with that hiccup at the beginning we were still able to meet our key date which was the demo NFEC? Which was a great milestone for us, and that was the power of SharePoint really there - allowed us to leverage it and get something to market quickly vs. something that would have taken us twice as long if we started from scratch.

*Besides features what else did MOSS bring to the table?*

Scalability, the fact that SharePoint is can scale to one million users with relative ease was a big plus. If you think of some of the big school districts like Miami-Dade or Broward, they have 350,000 plus students in their districts. If you throw in teachers and parents that could bring to user number to over one million. Given that district central host their application the portal offering that SharePoint is a big plus.

*What level of QA was the product subjected to?*

I think that our QA process is quite regimented and given the fact that we're going out with MOSS 2007 which was a new version – there hadn't been a service pack released for it at that point, it required a significant amount of QA regardless, because we didn't want to go to market with a product that had bugs,

whether they were our bugs or Microsoft bugs. Microsoft did fix some MOSS related bugs.

So it still went through our rigorous QA process, but I think by the same token , as Microsoft come out with their own service packs releases we benefit from that too as we don't have to do our own, so there's a certain benefit of using an existing framework or platform. But I'd say from a QA perspective, there was significant definitely QA done across the board, and I'd say one of the challenges that we faced is that the setup and deployment time for individual bills was significant. So I think that impacted our QA process significantly particularly if something was found like a block or bug, were it took 3 days to get an entire environment set up and that's something that we wouldn't have encountered before with other platforms but came with the complexity of SharePoint

*Was it easy as Microsoft said it was....?*

I think there was a couple of a challenge there. Internally it was hard to get numbers of whatever was to go to market...the actually concurrence usage was going to be. When we looked at Microsoft's white paper of what they produced it all looked good on paper, but in reality we'd seen instances of where they'd engaged with customers for large SharePoint installations, but they'd spent a significant amount of time tweaking infrastructure to optimise it and get it to work very well. So it's something we learnt that it wasn't as straightforward as we would have liked.

And then as well, there's a whole range of different topologies that you can deploy on depending on what your target audience is, and that's a costly endeavour as well to do that testing and to get the appropriate hardware to be able to do that scale of testing that you need to be able to do. So again, we didn't envisage that we'd have to spend upfront, but in the long run, over time, we've refined the solution to a point where we're fairly happy with it at this stage, but it's

been a bit of a slog I would say, to get it to the point where we feel comfortable that it's scaled. I think again we would have some concerns about it as a product as to whether it would meet the rapidly emerging potential customer deployments that are much larger than we would have ever expected. But Microsoft is constantly involved in SharePoint as well. You can look at SharePoint 2010 – what they're doing with their ads and platforms of service, and looking at whether you can do the same thing with SharePoint. There are potential avenues there that we can look at maybe tapping into that will provide us with avenues to be able to scale the solution in ways that we never even envisaged when we started down this path.

So in short, I think there are pros and cons there, but I think the summary point is that it's not as easy as Microsoft would have led us to believe I would say.

*Was the product developed only for the US market or was it global?*

It was developed initially for the US market that was the primary focus– the original LV was sold only in the US. But as the product grew people were quite impressed at what it offered and it was such a leap forward in generating the technologies from what had been there before. And organisationally we were growing an international arm and they were looking for a product that they were to list out the core requirements really married very well with what LV provided. So during the development cycle, it was assumed that the localisation piece would be relevantly trivial, but as we started to see a demand in the international market and we went down the route of seeing what we would have to do to make it internationalise, we saw that there was significant work required there as well.

*Can you think of any other lessons you learnt – either positive or negative?*

I think really one of the key things would be going back to the beginning I think we were kind of blinded by the shine of Microsoft and the offer of money, and there was a short term horizon that we were focusing on which was getting a version of LV out on a new platform. And as I touched on earlier, there wasn't a huge amount of vetting done, and the product strategy wasn't fully baked, we just presumed it was replacing the existing version of LV without thinking long term – were there other opportunities there.

So I suppose we should have spent more time as a company trying to articulate what is the vision for LV, in the future and based on that is SharePoint a suitable technology for it. And then trying to define that road map in the best way we can and actually have it down to 1 yr, 2 year, 5 year and then obviously it gets looser and looser the further on you go.

But I think if we had done that and if we were to align that with Microsoft's road maps for SharePoint, I think it would have given us a better way to pace our development and how we were going to go about delivering the features that we wanted to and we'd have had a better view of that up front. I think what happened in the end was we delivered a product – the 1$^{st}$ version of it, and it resulted in a cycle that then every 3 months there another horizon, another set of features wanted to be thrown in, and it was a much more reactive development process and maybe not as well thought out or well managed as what we could have done had we taken the time up front to actually bed down what the product strategy for LV is.

*Were there any unusual items in budget? EG additional licences costs?*

Yes, I think when we set out on this it was very much just looking at what we needed to do to develop a product on SharePoint, and the reality hit when we realised there were significant costs associated with this from a licensing perspective certainly...even the fact that we work in an outsourced model, if we

have some sort of volume or site licences for particular Microsoft products here, that doesn't necessarily mean that our partners do, so we may end up having to pay for things that we didn't think we'd have to.

I think one of the other key things was in and around the testing of the various topologies from the scalability perspective, the labs that we have to use to do that on physical hardware rather than buying the technologies ourselves is significant. And I think even just the hardware that we had to purchase to do local bills, testing and a level of scalability testing …they were all significant things that we didn't envisage upfront.

*Would you consider LV a success in the market?*

I definitely think it's a success in the market. I do think we have our challenges ahead of us though, in some respects it's been probably more of a success that was even envisaged at the outset, no one anticipated that a little product as the previous LV was would just take off, because it just seemed to hit the market at a point where it was looking for products like that.

So I think it's really grown and the perception among our customers and even across the board am actually really positive. We've struggled to try to keep pace with that. I think the amount of feature requests that come in now, and the fact that it has been successful but it meets a significant % of the needs of the teachers, curriculum alignment is a core teacher need and a growing aspect of it for students, it's been almost a victim of its own success, cos we're now having to really accelerate development paths – we've so many strands running parallel to hit key dates that we agreed with clients. And like any new platform that isn't mature, that hasn't been there for a long time, there are a lot of things that need to be addressed just because it isn't mature yet. So when you factor all that in, there's a lot of work ongoing in LV, much more so than I think we would have

even envisaged, so Yes I think its successful, but I think that comes with the pros and cons of that and challenges.

*Did one version of LV meet all customer requirements?*

I think the key thing when it comes to LV is that if you get into the realm of creating custom versions of products for different customers, it's a nightmare to maintain. So I think the key thing with LV is certainly there's a huge amount of configuration that can be done with SharePoint, so it's really about touting the benefits of that, as being for customers to say you can do x and y customisations. But from our perspective we didn't go into this with the intention of creating flavours of LV that would be specific to different states of districts.

*In terms of support, where does HMH support stop and Microsoft support take over?*

From a customer perspective, they'll come to us all the time for anything that's support related so really if the customer buys LV from us, we're ultimately their line of support.

Internally if we have issues we can engage Microsoft and we certainly have support agreements in place with them, but it's really more of an internal support that we would go to them for. As part of the deal, Microsoft agreed that they would use their sales force to actually socialise the concept of LV and to push it, so we leveraged Microsoft's sales force for that very reason which was a great tag team between our sales team and theirs. . That's really where Microsoft's interaction / support piece stopped, and really it's about us being the first in line for customer support and we're expected to fix any of the issues. If there was a SharePoint issue or something that required Microsoft's assistance we would go

to them, but it's really an internal thing and customers would be not aware of it at all.

*If you could turn back the clock, would systems such as SharePoint be your choice...?*

If I look back at it now and I look at the timing of it, I'm not sure if SharePoint was mature enough for what we wanted to do with this at the time. But again it ties into the fact that as a company we didn't really know what we wanted it to be ultimately and we didn't anticipate that it would grow as quickly as it has. So looking back it's easy to say it may not have been the best solution, but at the same time it got us a product to market very quickly. There are pros and cons to the argument, and we've suffered through some difficult times for having gone with SharePoint and the fact that the customer uptake has been more than we thought. So I think we could look back and question whether it was ideally the right approach. I think if we were to start the project now, I would think the portal approach is still a good one and I think that space is more mature now, so I think if we were starting it now we would definitely use SharePoint, if we were to look back and we say if we had a runway of 3 years before this was really going to take off and we knew that then SharePoint would have been the right decision, but given where we are today, and we do face some challenges, I think it's one that we would have to seriously think about

*Yes or No?*

I do think there's merit to it...it's a hard one to say yes or no to.

*Anything else?*

Product mgmt are really key, and some of the sales force e.g. Alan Berktoff could be a good person to talk to as he's really got his finger on the pulse of the customer, to understand what they want, and even to get an idea of what their perception of LV is. Because he's on the front line in many respects and he's going in there and putting his neck on the block, so if he's pitching LV he has to feel that he's not over committing something that the customer gets and he'll never get another sale.

I think it would also be useful to look at some of our internal people e.g. IT, creative, and on the international side have a chat about the perception of the product internationally, and does that product fit the international market or would we need to change it.

**Interviewee:** Mark Douglas

**Title:** Development of Learning Village

**Interviewer:** Eoin Murphy

**Date:** 14 April 2010

*Please identify your role within RCM = vendor company*

My role was team leader and technical architect so my responsibilities were to ensure that the product was well architected and the delivery of that was as good as possible, from ensuring we had right people and right technology and right setup given the product scope and product timer. That was my goal and my role within it

*So you worked with a vendor who took this product etc gave it back over to HMH who sold it.*

Correct – the scope or the project effort was really to develop a product on SharePoint, and HMH was the company who owned the product and who would sell it and markets it and our role was just to develop the product according to the requirements and the product scope that was provided to us.

*So one thing I've learnt from you is that SharePoint has been around for a number of years but 2007 is when the relatively new technology for this product kicked off. So how many SharePoint projects have you worked on previously?*

Well there's lots of different versions of SharePoint – there's WSS, there's SharePoint portal, I don't even know if I can count how many of each of them! Primarily I focused on SharePoint portal so that would be where I would have more projects. The WSS projects were less but I was directly involved in a number.

I was also involved in leading or mentoring a large no of projects that were performed by other individuals but I was the leader, the technical brains behind it. Right now I don't know how many but there's been quite a few.

*You mentioned there that there are a couple of different versions of SharePoint. What version was learning village written on?*

Learning Village was written on SharePoint Moss (Microsoft Office SharePoint Server) which used to be called SharePoint Portal Server. (SPS) That's the product that was chosen mostly because of the robustness in features and the ability to extend and build on top of it, where WSS has a lot of features but it doesn't have some of the audience and profile support that MOSS has.

*So basically you would have thought this would be a good fit because a lot of features already came packaged so to speak so this would have cut down on development time of implementing additional features*

Yeah it's interesting with this particular project (well it is in lots of projects) but this project was a challenge - there was a lot of scope involved and the timeline was very tight. And the hope was that the use of SharePoint in the form we chose would provide a significant speed improvement if nothing else, from the point of view of being able to accelerate the development cycle and use some of the out of box features to implement some of the features that were already in the requirement document.

*So at the top or your head….*

So in the grand scheme of things, when the whole thing got said and done, I would break down the components into a couple of categories, one being out of the box – pure out of the box which there wasn't as much as originally intended…ones that I can think of being the search mechanism, the profile from point of view of looking at a profile was at least the components of it were out of the box, but then you have a whole other section of components that were based on SharePoint functionality as its core infrastructure /functionality but were customized to meet the needs. Some of those things were like the content library which uses web parts and things which are SharePoint technology but they were customized extensively to meet the needs which learning village had. Other ones I can think of were profiles dimensions – e.g. viewing the profile was out of box functionality but editing a profile was customized out of box functionality if you will.

It's the same thing with a lot of other components of it …we used document libraries for a lot of the data storage which is a SharePoint piece of functionality. But we customized a lot of the interpage and security aspects of it so it was a mix of that. Then you've got the 3$^{rd}$ category which was when we completely rolled our own. Things like the calendar functionality, the permission to columns functionality – based a bit in SharePoint but also done purely by us, and not something SharePoint about it.

There's probably just as many things that were completely developed by us as things that were done exclusively by SharePoint and the big majority of applications were middle area – SharePoint functionality but it was heavily customized.

*Ok if you break it up in ratios what would you think?*

I would say 10% on either side and 80% in the middle

*Other then features, is there any other justification for using SharePoint?*

Its ability to integrate with user directories, this enhances user security. This is important as often student profiles are more sensitive than adults. SharePoint also scales very well, even though we make a good number of customizations, the underlined framework is the same and nothing was introduced that would have a negative effect on SharePoint's ability to scale.

*Ok you mentioned calendar there, was it necessary for you to write a custom calendar?*

Well the big challenge with the calendar was well when the requirements were originally identified we expected to use the out of the box calendar functionality. However when we got into the real requirements that the product manager and the business analyst were really talking about they were not really so much a traditional calendar – not really 'well I want to make an appointment here' it's more so a concept of days that you're in school and days that you're out of school and if you miss a day you want to be able to push those days out. So there's a very complex concept – its more akin to what you would think in project server or things like that from the point of view of scheduling and pushing things out if things go off schedule. And that's just not something that SharePoint out of the box supported in any way shape or form.

*Ok so basically the calendar offering out of the box just didn't meet the requirement?*

Correct

*So we've touched on your experience with learning village and your role in that and your previous experience.*

*How about custom development projects non SharePoint projects maybe using tech such as dot net or sequel?*

*Would you have many projects with those types of custom technologies?*

Actually before SharePoint 2003 was well into mainstream, so sometime b4 2007 came out one of my biggest things was working on dot net applications. It wasn't really until a year or 2 before 2007 came out that I was really doing almost exclusively the large majority of my projects would deal with or be SharePoint projects.

So I've done conversion projects from Java to dot net; projects which you are working on a customs simulation for casino applications which were all dot net – windows forms applications, web forms applications from developing marketing websites for entertainment venues so concerts calendars that kind of thing, also large websites for the purposes of...most of them were for marketing type websites or brochure style websites or websites that were related to line of business applications, so ensuring that businesses have data that they need and then once I started working in SharePoint a lot of that work was more in the education practice but I worked in both SharePoint and non SharePoint.

*What's your preference?*

My preference is to attempt to use SP for what its good at and what it's not good at do in dot.net. Right now my current job is all dot net and I doubt I will be doing anything in SP for the foreseeable future because the functionality that my work

entails today is line of business work and SharePoint is not really geared towards working with those types of scenarios.

My preference if I was looking for another job again would be to stay in the purely dot.net arena.

*So your opinion after working on LV project is SP a good fit for the type of content management systems that were being delivered into a k12 classroom?*

So as it stands today with my understanding ( I don't know all of the requirements – it's been a year since I last worked on Learning village) I think a large majority of the components that are part of LV would be more easily maintained if they were not built on SharePoint

For the purposes of this particular project and the way it presented itself from the beginning, I think your more in a grey scenario. For the speed and time required I think SharePoint was definitely helpful. But ultimately the biggest challenge that this project had and the reason that SharePoint is probably not the best solution long term is because the requirements and features change on a regular basis. And the platform that SharePoint is really meant for deploying something that is well architected and can be stable for a period of time and right now I think there's so much change going on its v difficult to upgrade and maintain those components more than anything else.

*So it is a good solution if there was an A to B dev cycle and it presented itself at the start, but given the fact that you needed to grow that to meet requirements it wasn't best suited for those ad hoc requirements?*

Yes absolutely, and I want to be clear because it's not necessarily annual requirements that are a problem, but the nature of the requirements in this particular case were so large and so radically shifting over functionality that that's where the problem was. SharePoint can handle it if you want to add an extra field here or 2, like 1 little thing here, but when you really don't have a clear understanding of all the requirements are going from the beginning – all the requirements are from A    to b and have a plan for 1 – 2 years in the future, you really can't start out a good solid base with SharePoint such that you can grow it in that fashion. I don't know enough about it today to know if that's there now, but that's what you have to have. It's the same with every product – you have to have it but with SharePoint it's key because when you change it that much it really makes your development life cycle a lot harder.

*How about UI experts and database experts, where they part of the development team?*

Not really, I mean there are members of the development team that are strong when it comes to UX design and SQL server. But we didn't have individuals that were solely focused in those areas. I think we have enough SQL depth in the team to have covered all the SQL concerns. It is a very senior dev team. In hindsight we probably could have used a dedicated UX expert. I mean, MOSS isn't that difficult to skin and the underlining MOSS technology is just dot net, but wireframes presented to developers would have been useful.

*Can you think of any other disadvantages with SharePoint?*

Yeah, your relationship with Microsoft as a partner and a platform and the rigidness and complexities of their development cycle really complicates the

situation. You're on a platform that if Microsoft founds a critical bug and needs to fix it you need to go deploy that out with all these customers. If SharePoint dev 10 is coming out, that's much different how do you upgrade, what does that mean, those are the things you won't be able to answer that yourself, you can't look into the future.

And Microsoft is such a big company that its v difficult to get solid good answers to that. And some of that's due to the fact that any company when their developing a product like that it takes a lot of time to figure it out, but Microsoft in particular they've got a lot of customers that are out there and vying for attention.

Another thing that's a challenge is resources. When this project started the number of people who knew SharePoint well was very limited. You're not talking about being able to go to anyone in world and saying I need you to work on this and they'd be able to do it. People didn't understand half the stuff that was being done or why it was done that way. So I think that is another challenge – another drawback with it when you talk about developing it in the fashion that was ultimately that Learning Village was done.

I also think that the scenarios, the contrast with what you can do with sp and what you're supposed to do with sp were not until half way through the project fully articulated by Microsoft. So what I mean is that there are certain things you can do with sp because their APIs are there you can make it happen but the product was never really intended to do that. Because it wasn't intended you end up with performance problems – different things that are not great. But when you started out, when the product was first released Microsoft didn't say 'Oh we really didn't mean for people to do that' but then half way through they were like 'oh you really shouldn't do that'. That's something that you can't control and it's not Microsoft's fault necessarily but it's definitely a challenge and something that makes it difficult to use it.

*Was that because it was new etc?*

I wouldn't call it new to market but I would suggest that Microsoft marketed it differently. When Microsoft released SharePoint 2007 they really pushed and said "man we're building all these cool things in it and you can customize it and do anything you want with it and it's the Swiss army knife and we built it and you can do anything!"

That's what the marketing people said and the sales people and then when you get into it yes they made radical differences, they really made it so you can programme against it and extend it, and absolutely against other products in that state it's an amazing product but you can't really do everything with it. And that is were the marketing of this as a radically different product and the reality that it was different but you couldn't really use it as a platform for the development of any type product, Its really geared for certain types of things which Learning village in its essence is one of the types of things it is geared for, but that doesn't mean that it can do everything that Learning Village wanted to do. It's really good at some of the things. The other things may or may not need to be within SharePoint;

*Is development creativity restricted...?*

I would say it does work that way, I wouldn't say it happened that way every time, but it comes back to my point that you have to have resources that know SharePoint. The reason you have to is because you can't just take somebody who knows asp.net and

 say go build this cos there are so many nuances within the application framework that you would need to have somebody who has that knowledge about what they're doing to be able to dev it correctly. On many occasions we thought we can use this and this and this to make it happen based on the documentation and then when you get into it we realized 'oh that doesn't really

work the way we thought it would work lets adjust and make it work' and even the fact that we were looking at using these components, we were already conforming ourselves into the SharePoint world to make sure it functioned properly and worked properly.

*Is it difficult sourcing developers with SharePoint expertise? You've already answered that one so I'll move on.*

*Prior to the project have you worked on other solutions for a K12 industry?*

When I started working on learning village that was my only vertical or space that I worked in. I worked for mostly school districts and some conglomerated school districts, and some for application providers like HMH but the primary people that I worked with K12 educators and districts.

*Do you feel that this LV product satisfies teachers' needs?*

I think depending on the school district. In my opinion there's been a big change in the way that educators view things, not necessarily the teachers but the school districts and it has a lot to do with the fact that the teaching population has aged and there's a continuing trend where the senior educators who have the experience and knowledge and who often plan the data are retiring, and the districts are losing that data, and the new teachers when they come in are having difficulty teaching to the standards because that's the big thing now – the standards. So Learning Village the way that it captures the content and associates the standards and allows you to search for things based on those standards etc, it's very useful

To end users, I know many districts that have asked us to build something similar to Learning Village not even in the close realm of the scale but similar in functionality and that's something that has been key and LV def builds to meet those needs. I know the LV 1 product has a lot of those features, I think the big differentiator and the big thing that LV brought to the table was the interface and the way you could act with the data, and the way you could look at that data in (hopefully) a more easy to access manner. I think that was the big diff between LV 1 and 2.

*How are the standards turned from a govt department identifying those standards into a piece of technology?*

So standards in their own right are a sheet of numbers or identifiers and descriptions in a hierarchal fashion. So what the state does is it says 'these are the standards you're supposed to teach'. And these are the standards for this grade. So they have a big list of you should teach addition and subtraction and then they take that standard of addition and subtraction and place it under 1$^{st}$ grade or whatever grade they would like and then the expectation...(this is usually done by state or city) and then they take those standards and they apply them to specific content or handout sheets or tests, and the expectation is that the standardized tests evaluate students on those standards because this test is on this, this and this, as long as the teachers are teaching to those standards, that they'll do better on those tests and the quality of education will go up. From a technology perspective we take data readouts of these standards which are in XML or combined format and import them into a product like LV, into SharePoint and from that import that generates that standards the user actually can for a document or handout that they input into LV can select what standards they would like to have that document be associated to. So the teacher – the content creator– would say that this is a handout for addition and subtraction, go in and say Standard this e.g. Georgia standard e.g. it's an arithmetic K1.1.1.3 that's the

standard that they are dealing with - the identifier for that standard, and LV has the ability to search and browse on it and have access to that content, so when a teacher says my students did poorly on this exam for adding and subtracting they can go in and say 'give me all the content for adding and subtracting' and they can use this content in their classroom immediately. And this content is approved and vetted – its good content.

*And does SharePoint do that well?*

Doing hierarchal relationships, SharePoint does not do that very well. That whole component of it within LV was done outside of SharePoint; however it was done in such a way that the data was actually stored in SharePoint so it's one of those mixed cases I was talking about. So we leverage SharePoint in a way to associate that, but we had to build an entire SharePoint component as a way to visual and manage that.

*Development cycle quite short…do you feel that reduction in development time decorates the quality of the solution?*

I think a lot of these questions go back to the scope and the type of solution. Ultimately if the goal is to produce a product that's quick, no matter what type of solution you use the quality of the product isn't going to be great, or the features are going to go down. It's a common triangle that you think of in development, you've got time, you've got quality and you've got price. One of those has to give up. You can't just have a super reduced timeline and then expect the other things to stay the same, regardless of what type of technology it is. The effort of using SharePoint was to attempt to improve quality and keep timeline short, however in the case of LV, the biggest challenge was the expectations around what would be delivered and the assurance to "we want it to be like version 1 and even

better' but there was no definition of what V1 really did. So we had a situation were expectations of what SharePoint could do were much different from what expectations were of what it would actually do – what the final product would do and look like, that more than the timeline attributes to the usefulness or the quality of the product. Any product regardless of what technology you choose (like you're told to build a horse and later on in the project somebody says you really meant to have a cow, you'll end up with something in between) and that's in my opinion what happened: the difference in expectation of what would be delivered and the hard and fast requirements that were provided were pretty great.

*But this wouldn't be technology specific?*

Yes, but it was compounded by the rigidness that SharePoint had, so the challenges, things that were technology specific, we looked at it from the big picture, once we started on a single path and started to work down that path for a specific component, not necessarily for the big picture but for a specific component, and once we got part of the way down and somebody decided that they wanted something different it was very hard to make those changes. That's related to SharePoint, the product and how it works and the rigidness of it, but the fact that it happens and that it affects the product, that's really any product, any technology and it doesn't really matter.

*Future proofing...Microsoft releasing patches in 2010...? Was that a challenge?*

Yes it's definitely something we considered, the biggest challenge regarding that was QA

Ultimately Microsoft's job is to make sure that whatever updates they make to patches don't affect us. Very little change should occur, and the API should stay

the same. That's the contract they build with the developer, when they create an API like this. The biggest challenge is as a product vendor that you never trust that they're doing that absolutely you want to make sure that you've tested that. And the QA process for the product and the ability to validate it was less than ideal, being able to ensure that these different versions don't affect things is key, but there were simply not enough resources (human or technical) to really evaluate all of those scenarios – like what does it do for performance, and what does it do for all of these different things. Really in order to make sure that you're deploying something that will work across all these platforms you really have to have that, you have to have an environment that has different versions you can test on and all those things.

*Do you feel that SP products are suitable...?*

SharePoint is really not geared for kids or educators out of the box, so it's absolutely the case that it's a challenge to make that work. I think the expectations from the technical team were that the user experience was not as key from the point of view of all of the other features, as the marketing and product management team. I think there's a very big disconnect in this particular project

In general, we've worded on lots of different products mostly from the SharePoint world for educators, and when you talk about using it for teachers, its fine. The teachers are able to navigate it and use it for the most part – there's a lot of training that goes on with it – but for the most part we've had lots of products that were very successful with SharePoint, basically out of the box...as is.

Teachers are in their essence, employees in a corporate environment. Their corporation may be federally owned, but that's what they are – they're adults and they're able to do that.

When you start talking about children, especially K through 4<sup>th</sup> or 5<sup>th</sup>, the ages will differ. Having them to be able to access that site, and be able to have larger text or finer colours or other things, that's where it really falls down. I think the biggest challenge with LV was the expectation (as I said before) really regarding how much of it was going to be fluffy and soft and customisable to make everything different all the time, which is difficult no matter what platform you talk about. If you talk about developing this in a pure dot net environment making it such that you can change the U I and keep multi language support and all of the other features, that's a pretty tall order!

HTML and WebPages and how they work especially with their requirements to support I6 which is a difficult browser to support, it's a challenge for anybody. It's an extra challenge when you talk about all of the stringent features that SharePoint has regarding that.

*If you started again would you use SharePoint?*

It would be a difficult decision. A lot would depend on the time. Given the same amount of time that we had, and starting it right now, I would probably use SharePoint but in a far different manner than what it is today. I think that's probably the best answer I can give. It definitely would have been radically different than what it is today, but SharePoint would have been used at some level.

**Interviewee:** Mary Jones

**Title:**        MOSS Based CMS Overview

**Interviewer:** Eoin Murphy

**Date:**        22 April 2010

*What is Learning Village in your words?*

Learning Village is a personal content management system that allows collaboration around structural planning, standardising curriculums that really is designed to meet the needs of a district curriculum instruction department and the work that flows around that curriculum instruction.

*What role do you fill with LV?*

The product manager and customer requirements

*How many schools would the Miami Dade district govern?*

About 350 schools from age 5 to age 12, and they're typically broken down into elementary which would be age 5 – 11, middle school which would be age 11 – 13 and high school age 14/15 to 18 when they graduate.

So typically they would have around 325000 students and 30000 teachers and the related school administrators and district administrators.

*Would you consider Miami Dade as a typical district in the US?*

It's one of the largest in the US. I think it's like in the top 5 for size. As far as its structure around curriculum and age groups it's typical. Just in size it's bigger. They may be more advanced technically than some districts because they have the money and resources to have more IT staff and more revenue to buy.

*School district budgets are managed at a district level etc?*

No. Local Control is the term that they use. So they provide the district with money, and the district then allocates that money out to the schools. There are certain guidelines such as for textbooks so there's consistency across the schools for that, so textbooks could be a district purchase. Technology in some cases is purchased across all schools, but usually that is on Local Control, when you're looking at individual software programmes, school based software programmes, they're usually given a budget. If it's a district wide solution such as Learning Village, that would be a district purchase. There's a lot of self control on the school budgets.

*Would it be compulsory for all the schools in that district to adapt LV?*

While the district might buy it they'd expect the local schools to utilise it, it varies from district to district as to the level of accountability. Miami for example says that every teacher will access it every day. That's at least a guideline. Some districts just say 'here it is for you to use if you want'.

*Is there a good uptake from Learning Village product in Miami Dade?*

Based on their previous platform its increasing uptake as more content is provided and more teachers get trained the usage is significant. If you look at

Palm Beach, which is a slightly smaller district, within the top 9, you have unbelievable usage; we're talking about millions of users.

*In your opinion what are the advantages and disadvantages based on a SharePoint system versus custom content management system?*

From what I understand, it did allow us to provide a solution quickly, leveraging the portal platform. It also allowed us to select the platform that many districts use as their enterprise platform and then help with integration. So the (Counter?) platform those districts may be using to support integration of the learning village platform, and maybe an enterprise portal platform. And I think potentially with some different design like maybe designed with less custom and more out of the box, it would have allowed for some more scalability and more flexibility engrossed in the platform, extendable.

*So did HMH push to do this on SharePoint?*

The functionality requirements came from the customers. The platform came from... (I'm not sure really how to word this legally) It's around the partnership with Microsoft and HMH.

*Any questions I'm asking you are really customer facing perspective...*

With the portal being on a Microsoft platform, it had some features that we were already familiar with, just using laptops that made the professional development easier as well. If you look at some of the PowerPoint documents I have (Mary shows the PowerPoint docs)

What are the big selling points of the product compared with more traditional *content management systems?*

Mary shows some more documents.

*Was the product initially received well in school districts?*

Absolutely, especially the school districts that were on the older version, and they saw the new UI – the more updated UI with the platform, the new functionality that's added, the option to integrate all those features were well received. The collaborative offerings

*Did the product perception improve as time went on?*

I think there was some frustration as you would expect with any new product, because in the 1$^{st}$ year you're really stabilising the product so you'd find bugs and fix bugs, and I think the customer expectation is improving which is not difficult.

That would apply to any platform; it is not something unique to the solution. That's just a misperception I think.

*What would be the product's highlight?*

Ok, we've got the Detroit press release that you can talk about, because that's going to be how the portal solution integrates the single sign on with other applications. You would have the Miami story, which again is a SharePoint portal

integration. Then you would also have our migrations from our current customers to LV.

*How about pain points?*

Pain points would probably be level of the solution so that impacts all aspects of the business – our sales people have to be able to understand it well enough to sell it but not be overwhelmed by the technical language. The implementation team, meaning the product managers and the trainers, have to know how to configure the system (it's much more technical than they would be used to) and then train others on it, while it's not as difficult for the teachers it means a longer setup time and more customisation. So really it's just around a more complex system, it means you have to have more detailed knowledge.

*So the initial setup is more challenging...etc?*

Yes, there's more features that the sales people have to understand, and because it is this technical portal solution, we're now engaged (and this is probably one of our highlights) not only with the p side of the district which has one set of monies to spend, we're now also engaged quite heavily in developing relationships with the information technology side of the district that we've never had contact with before. Because we've got a more technical solution and they're interested in all of the portal aspects and the platforms, and we have their monies that they're interested in contributing.

*Because it's a more technical solution, would that be more difficult to support?*

Do you mean from a HMH perspective?

*Yes*

Well you've got more aspects for troubleshooting. Again the skill set for all the organisation pretty much needs to be higher. When you look at the portal solution, you've got a very complex solution out and now you've got to support multiple clients. So it's a technical solution versus an ASP solution. Looking forward it might be easier for HMH to provide an ASP type solution. Because you need more people with that skill set supporting it in all the districts that have in their own environment, versus a smaller group with that same skill set supporting it in a central location.

*What challenges have you come across trying to implement it...?*

Challenges, there's a lot more consulting because it is configurable and it is flexible, so there's a lot more consulting upfront and design that needs to be done with the district before they go and configure it. So it's not just configuring the server, it's really configuring the application itself that's complex. And it's not so much technical, it's really that there are a lot more things to switch on and off and define, and a lot more time to do it.

*How does the product better cater for teachers, students or IT staff?*

We don't have as many students on the current project as we expected – you know the plan was to have more student functionality built in the next year, so we haven't done that yet. So we would expect more student features to be added that would enhance the student experience and then therefore have more students using it.

*So this being a curriculum management tool, it probably does meet that need from a teacher perspective?*

Which is the teacher in the district managing the curriculum versus a learning management system or an instructional management system, were the students are actually getting their assignments and the system is tracking their system?

*So this is on the road map – you want to develop the system to better cater for student needs?*

Some content management and instruction management. So you're leveraging the content that's in it, and now being able to find it and track it for students.

*So the whole time you're getting open to that LMS?*

Not just an LMS just focuses on platforms. I've got publisher content to fit in and now I'm going to assign it to students. Content management allows you to add multiple content from publishers, district content, and collaborate on it, and have a lot more features than an LMS has. And then you've got an assessment management solution, which what we're looking at is having a portal would allow you to have a more simple solution that you can either integrate, or build on, to answer that total solution that districts are looking for: substance management, content management and instruction management tracking, even professional development management.

*Is the Microsoft label an advantage or disadvantage?*

I think it gets us in the door of a lot of places that we aimed to get in the door before but couldn't. A lot of the technology decision makers in school districts like Microsoft because they are familiar with the products and generally causes them less pain. And I think you'll find a lot of people who are still interested in open source versus Microsoft products. And they descend the cost. And districts have already invested in them; it's kind of bad if the districts had never invested in them.

*So if they have SharePoint licence, that cost would be taken out of the curriculum management system?*

The cost is mostly passed on to the district. Microsoft does give us a special rate because of the strategic partnership. But the cost is still quite a large amount compared with some applications that have been built from the ground up.

*How does LV cater for district management needs?*

If you look at the custom configuration of the out of box features, for district mgmt I think that is were you probably have to (I don't know – I'm not an engineer) I'd do some things around the templates and the templates being formed, we had to lock them down...

*Well what I'm asking is does the solution LV meet their needs?*

LV does, but it's not out of the box SharePoint. And this is the value added – why would a district buy all these versus SharePoint itself, because of all these

custom features. We've designed reports, rather than having a SharePoint expert in the districts design those reports, we've designed the reports to really meet the needs of instruction and curriculum. And some of the other planning – that's the value added, otherwise the districts are going to buy SharePoint and configure it themselves.

Although the other advantage to an LV platform on SharePoint out of the box is that they often don't have the skill set to build and even if they do build they lose that person and don't have anybody to maintain it so it's that skill set that they also lack to build it themselves.

*And the advantage for IT needs is they keep out the scale...?*

And director integration, so they don't have another user management system to support, it fits within all of their other software updates and their cycle and probably even backs up their store type machines, I don't know if they've the systems to do any of those things..

*Have you come across any other products ....?*

*So are there any more products like LV on SharePoint, or are there any other products like LV on any platform?*

Any platform, say IVM, portal solutions etc

If you're looking at portal solutions the main one would be SharePoint. Dot net or SharePoint, or a Microsoft solution.

*Did it being technically more difficult to implement affect cost?*

It is a more costly product to buy, more services. Initially, like at the start-up. One of our challenges is to get a lower entry level cost.

*What is Miami Dade's attitude towards the system?*

Mary shows Eoin some quotes. – HMH website under press releases. Teacher of 27 years: "this is the best thing you can give me because now I don't have to write all my own lesson plans, I have those resources"

*Just wanted to find out a bit more about the funding for American schools…?*

Well they get a lot of money from the government; school districts are federally funded partially. Public schools are anyway, not private. And then the federal money has a lot of restrictions to it, so you have to be in compliance as to how the money is used. Then there's also local funding, usually based on some kind of real estate pack or city pack income. Then the monies are budget across the system, you're different operating budgets, and then you've got a per student budget.

*You mentioned compliance there…what typically would they have to meet?*

There's a large variety, there's actually probably a website for education with examples. You have to have 170/180 days of instruction to qualify for the money. If you use the special education funding devising then you'll have to serve special education students, and maybe if you use technology integration money for

example, a percentage of that needs to go towards professional development products. Textbooks money can only be used on textbooks. Etc etc

Section 508 = acceptability compliance.

**Interviewee:** Paul Gavin

**Title:**          Implementation and Support of Learning Village

**Interviewer:** Eoin Murphy

**Date:**          15 April 2010

*What is your role within HMH?*

Basically I am part of the field engineering group, but mostly my focus is on supporting products that we have out in the field, mostly LV and fixing any weirdness that happens. Generally if there's a bizarre problem it ends up on my desk, the $3^{rd}$ level, before it gets pointed to DPRD for bug fixing.

*So what would be your main background?*

My main background is quite varied. I've worked from systems admin on back systems all the way through to computer networking, to what I do at the moment.

So it's a very varied background which is good, because with districts what we see out there is very varied so you need to be a jack of all trades.

*Can you explain the implementation process?*

Before we even get the system we generally have discussions with the districts to ensure they've got the hardware and software and licences and stuff set up, so when we go to do an installation, everything's prepped. We do installations either on site, which is the usual thing as it allows us to touch base with the customer, and it's easier to form a relationship with someone that you physically see.  Or for upgrades and stuff we usually do it removed because visiting the customers is

cost ineffective in general, because you'd be spending 2 – 3k on flights and hotels and stuff. And the worst part is that it ties up that body – whoever's doing the install, because they can't be working on anything else.

So by the time we do the install, we have the basic scenario of what's going to be set up. We've talked to the project manager; we usually have 1 project manager from the ECT who is dedicated to the district and works with them on setting up templates etc.

From field engineering point of view our role is to do the installation and get it up as a minimum system to a point such that the PM can then go in and create templates and ask us to load up standards or whatever. So we go in and we set up SharePoint in most cases. In most cases we set up SQL, in some districts they've already got SQL set up, in a clustered mode or whatever, and we basically just do the install and get working, go through the stop checks, and hand it over to the PM.

*Would some districts actually have installation of SharePoint already?*

Some of them do, so there are 2 things we try to do. 1 of the things that we try to do is to standardise their deployments which makes it easier for them to support. So what we would ideally like and what we try to discuss with the district is that if we can run a separate MOSS farm with just LV on it, that's our preference. In some sites that's not viable or acceptable to the customer, so we actually co-locate the LV web app and LV SSP on an existing farm that they have. In some cases they may have staging environments so we may do the deployment in staging for them and then do it in production. In other environments we may only be allowed touch staging so we may have to hand over the install documentation, walk the customer through how to install it in staging, so that the customer themselves installs it in production. And the problem with that is troubleshooting

then, because you don't have access to production, it becomes very interesting from a support point of view.

*What's the reason for recommending that you'd have a separate MOSS installation, though districts might have a MOSS installation of their own?*

The reasons we give to the customer to have a separate MOSS farm for the installation is that it makes it simpler to deploy. Some early versions of LV deploy some of the WSPs globally, and they would overwrite early versions of LV weren't able to lock to a named SSP. So a lot of the early rules on how LV could be deployed mandated as such, that we had to deploy it in a single farm.

A lot of those things which (blank on tape) so now you can define which SSP to use for LV, so you can actually have a fixed SSP (blank on tape) whatever other web apps are running on the farm, and one for LV. The other reason is upgrades: one of the problems we have with LV is that we are pretty bad at keeping up with MOSS service packs and patches, and if a customer is running another app which has to be on a certain level, the same we that we mandate that LV has to be on a certain level, then it's easier if you have a separate farm and keep that whole farm at a specific level rather than having to balance off 2 different applications which may have 2 different underlying requirements. For example LV 2.1 mandates that you have to have MOSS SP 1, what if your other app on the same farm mandates that you have to have MOSS SP2? You can't run 2 different SPs on the same farm.

*Does that mean the district has to have 2 separate MOSS licences and do you get much pushback from that?*

We have a special agreement with Microsoft that we can sell LV as an OEM product with MOSS packaged in, so as long as the districts are using MOSS

exclusively as the back end for LV they get a ridiculous break on the price. That obviously doesn't apply if they are co-locating the farm, but if they're co-locating the farm they've probably already bitten the price of bringing in the MOSS farm anyway so it doesn't matter.

In early versions of LV we had probably a big price point wise, in that we had to have sequel server licences for every server in the farm, but that's no longer necessary with LV2.2. With 2.1 we don't have any reporting services but we still had a lot of those licences because customers would have bought them with the 2.09.

The other reason we like to have different MOSS farms is obviously trouble shooting. It makes trouble shooting simpler as you only have a simpler system – you only have your 1 app to worry about.

*How does the installation of LV compare to other projects?*

I would say LV is one of the most fiddly installs we do, because it is so tied into how the district does things. For example an LMS install requires a single user account to run. LV requires at least 11 accounts so right there you've huge administrative overheads which we foist off on the district, but at the same time, because of the extra complexity involved, it makes it more likely that there's going to be a problem. Also a lot of the steps in LV are very manual which is a problem, because the more manual steps you have the more likely things are to screw up.

The process itself it's just time sync, it's not horrific, but as I say it's just fiddly, and it's not a pleasant install. I've a lot of issues around MOSS as well, especially in multi MOSS farms. One common thing that we're seeing in all decent size farms, so that's 1x1x1 or bigger, is that MOSS half the time or more, will fail to deploy a WSP across the farm, and obviously that causes issues, when

something that you expect should always work doesn't half the time...that sort of fiddly stuff.

*And is that fiddly stuff application (LV) specific or more SharePoint?*

I think that one is more SharePoint. I think there's a lot of steps in the LV install that should need to be automated, because we do the same steps no matter what, like they're not customised per site, things like modifying profile pages is done for every single customer, has to be done and won't work if it's not done so it screams out for automation. Whereas some stuff like the LV settings page which is such a huge improvement to what we had before we had that, allows us to semi-automate a lot of those choices.

So it's getting better, that's the usual stream for our products anyway – abysmal at the start and then slowly gets better over time. Data migrations have been time consuming and complex. For example, if a new version of LV is released then best practice dictates that all data must be backed up, this is a complex process. Not like a regular SQL data backup. In fact if any type of LV maintenance is required it generally takes a long time and can require onsite visits. Customers have not been happy with this.

*Who are your main customers? What kind of collaboration happens between a typical district and yourself?*

Probably most of the discussion I would have would be with ECs so the internal HMH EC team, and they would be the people that would relate problems into us, as they would be the people who would find them first, and then depending on the nature of the problem, either the field engineering team will fix it directly or else we may need to talk to the district and discuss with them things that need to be changed. Because LV is touching so many things, it's more reliant on AD than

any other of our products; it means that we have to hand off a lot more responsibility. So we will never get AD domain access to a customer's account, and to be honest we don't ever want it as this would make us somebody to be blamed if something goes wrong. So it's a delicate balancing act, as in we don't want any more rights than we absolutely need, but that kind of point is much higher up on the LV side of things, than on other products were it's much more self contained. And a lot of that is because of MOSS.

*Is not having access an advantage or disadvantage to you?*

It's both. It's a disadvantage because when you're troubleshooting it means that you've got this huge black spot that you can't look into, so for example one of the things that we went into with permissions for users is that users may be members of different groups – AD groups which are then subsumed into SharePoint groups, which are then subsumed into CIT permission roles. We can trace them back manually to the SharePoint group and see what the AD group is, but it's very hard to get the membership information from that group, and we kind of lose focus at that point. So that's the disadvantage.

The advantage is we don't want to have access to it because it makes us so easily blamed, and no districts will give us access to it anyway.

*So as a nature of your job would you have a lot of interaction with IT folks, and district administrators etc etc?*

So yeah, I probably would work with them on an as needed basis, I'm not in sales so I wouldn't be going around touching base with them every week, but if there's a problem, I'll be communicating directly with the IT people?

*And in your opinion, what's their reaction to LV?*

It's hard to say because most of the IT people that we deal with ….in a district there's 2 groups of people that look after LV: there's the instructional technology department – those are the people that said "hey we need LV, it's a great piece of software, go out and buy it" and then there's the IT group, who are the people who run the servers that this is going to get dropped onto. To be honest, the IT group don't really know the application, they don't really care, they just see what the requirements of it are, and how well it runs. So they're looking at it from a high level – they don't know about the functionality, they don't care about the functionality, they're not interested in the functionality, so they view everything that causes them work as a bad thing which is perfectly understandable. And LV does have a large footprint. And one of the things we'll fight with constantly in districts is the idea of functional accounts. Which is a generic account, and the reason that the PMs like to use them is, if I'm creating a block of content, rather than creating it as Paul, maybe I want to create it as Maths designer, then if I ever leave the company, all that content can stay as Math designer, so I don't need to change it from Paul to someone else. So it's a way of allocating that stuff to a generic user. IT people in districts don't like that because they've lost that unique personal association. If I log in as Paul they'll know it's me but if I log in as Math designer they don't know who it is. So it's those kinds of things that cause problems. Then we've the other world where if we have performance problems that causes work and people don't like work!

*Is there any customisation that happens with LV after the install?*

There's basic customisation which would be things on the dashboard, banner pages. For the most part that its, but for some districts we do deeper level stuff such as exposing WebPages that might just have the calendar web part, there's

some integration into other single sign on systems, but for the most part what we're trying to do is keep things as standardised as possible. We don't want to make any changes because when the next upgrade comes it'll nuke those changes and hence it will become a support issue – something we have to track. What we do see is some districts because we're running fully AD, (because in our older products when we didn't rely on AD we would have exclusive access to the management interface) now that we have our access to AD whoever knows AD can use that account, so e.g. when I'm asking for an LV system admin account, I get one and someone sets the password, so now that user as well as me can log into LV system admin and make any changes they want to LV. So we have that in a few districts that district administrators themselves are making changes, and that's a problem going forward.

*That was my next question, who would do these customisations?*

People who are viewing this as something interesting and how want to expand the focus to cover what their customers need, and their customers would be people like teachers. So e.g. in one site, this user was trying to set up views, so that rather than have to use the content filter to filter out different things, he want to set up views, he wanted to set up WebPages so that people could jump to a specific view which would already have a search string embedded.

So they're not trying to break the product, they're trying to make it better using out of box SharePoint functionality, Of course because LV uses so many custom things as well I don't think that sort of thing works. I think there are tweaks you can make but it's more likely to cause problems than solutions.

We do try to discourage this but they're doing this for a reason, so we try to find out what that reason is, so we try to make sure that what they're doing is something that we'll be able to support. And it may be that they'll come out with a

really good idea and it will get slipstreamed into the build process, but of course the build process takes so long, they don't want to wait 6 months.

*What's the competency level in the districts with SharePoint?*

I would say that the knowledge level is highly varied, in some districts they don't care about SharePoint, they really don't want to administer SharePoint, and they just want LV to be a black box that works all the time. And in those districts we'll do most of the maintenance on it.

*And which do you prefer – the districts that have the knowledge or not?*

Ideally you want somebody in the middle, somebody who knows enough not to be dangerous, but not somebody who's completely hands on. The really dangerous people are the ones who want to experiment, because a) they'll never say the broke anything! But if you've people who don't care about SharePoint but want to make sure they've really solid backups that fine. The ones you don't want on the other side are the people who treat the whole thing as just magic and those they don't have to do anything. It's a balancing act – you want someone in the middle. But if I had to trade I'd get rid of all the people who want to fiddle with it all the time. I'd take the ones at the bottom level first.

*Typical install process vs. custom built solution – what's your preference?*

Well that's kind of getting into using MOSS versus something else as a backend. I think unfortunately the concept behind LV which is a very controlled environment doesn't fit well with MOSS which is a very open environment. So a lot of the things that we're trying to do on LV, we're fighting against Moss. I think

that it's more likely that we could have put together custom rules in something like an ASP or Java or any other backend, that may have ended up with a faster, smoother system, whether that would have been quicker on the development side of things, I don't know if anyone could predict. I think that the advantage of having a blank system to start with is that you're not fighting against the environment, and you know how much of our time has been spent fighting against Moss instead of using Moss. And when we're fighting against Moss whether we're taking more and more performance hits for doing that, because if you're not doing it the way Moss wants you to, then Moss isn't going to be tuned to do that. It's probably a better question for you or one of the techs.

*Microsoft really touts SharePoint – one of the big selling points is scalability. Do you agree with that?*

I don't know the answer to that because I haven't seen what finely tuned pure Moss environment would look like from a performance point of view. I would say that our performance numbers at least in the early stages seemed very poor from the number of transactions per second.

*If you have a problem and you suspect its Moss, not LV, what do you do? Do you go to Microsoft?*

Ideally we would like to push it back to the engineers who developed it, because we don't have the visibility into how the product was developed, in order to discuss with another vendor like Microsoft, so because we don't have enough info to see what's going on , it's not really something we can open tickets on.

But normally we just pass things through the giro process, and if DPRD talks to Microsoft about specific issues then that's fine. What we do see in the customisation world we'll see Microsoft selling services into a district where they

want to customise parts of LV like the calendar web part I was talking about, so that falls more into our world, because they're just dropping ASPX pages or similar within LV container.

*How do you come up with recommending topologies to districts?*

We do blind guesswork mostly! We try to estimate based on what we've seen work well in other environments, and obviously whatever info we get from DPRD on sizing, and we try to use both of them. Our goal is to try to minimise the hardware expenditure that the customer has to put out, but balance that against how much performance they want to use. So as part of the initial discussion, we'll be asking what's your user population, what sort of no of users are you looking at having here, is it going to be mostly users creating content, or will it be a small team of users creating content and most of your users will be read only? Are students going to have access?

But the problem with this methodology is that it's really experience driven and especially when you have a brand new product, you don't have that experience. So it means that, as you know, our original specs for LV 2 are probably in the region of 4 – 8 times more powerful than the original specs. So that hurts us because obviously customers buy what we recommend.

*And do you think that's because it's a new product or is it SharePoint related?*

Probably this is more SharePoint related than anything; I feel that SharePoint is just heavier than anything else we've put in place. That's just the way SharePoint is, because it does everything it's going to be big. E.g. our smaller systems like destination success; we might be running half a million users off 3 servers, 1 sequel and 2 web frontends.

And we would be lucky to do 1 tenth of that off a 6 server farm for LV.

Obviously the focus is different - Destination success is mostly a content push its not doing a lot of brain stuff at the back end, but really LV shouldn't be doing that much brain stuff either, it's really a glorified power depository.

*Is the long release time of LV a challenge? Are customers prepared to wait 6 months or in the past have you had to highlight something as an emergency and do it before 6 month period?*

We really haven't had any what I would call rapid boat fixes in LV; I mean a code drop to fix a specific issue. I don't think the way LV is architected is allows it to do that because the way we deploy LV is as a single WSP so we'd really be flushing and reloading an entire WSP even if we were just fixing a type 1 1aspx page.

What we have done is we have pushed for and gotten work around, so e.g. if there's a bug that's being caused by something we can get a work around to fix it, whether that's something like the searcher replace tool, which renamed URLs which were broken as part of the 209 – 2.1 or forcing the re-association of bookmark folders to specific users which is a problem that we have run into on multiple sites post 2.1.

The code fixer that's in 2.2 but we've been seeing it since 209 days, whenever that was released.

So we have work arounds but we haven't had what I would consider a fast drop fix. I think not being able to quickly turn around solutions especially minor ones, (I'm a big believer in fix all the minor issues because it makes it look good, e.g. fixing the typos etc. like if streets are clean people are less likely to litter. If it looks good and pretty people are less likely to complain about stuff but if it looks shoddy people will complain.

*Do you think that LV does look pretty...?*

I think that LV suffers from inconsistency of user interface across the product.

*What's your gut feeling on the issues, is that how LV is developed or is that more SharePoint?*

Because LV is mostly skinned, so it's a skinned LV, most of the areas that users see were developed....I think it's a LV issue. I think probably from the development process it's because there wasn't 1 person who looked after UI. It was more like 1 person looked after key words, 1 person looked after this and that. But they did it if you want vertical. So they did it all the way up, but that meant that at the top layer nothing looked the same.

*So that could have been avoided if someone was actually looking at the whole UI?*

I do believe so. I think that's probably 1 of my pet peeves about it. The reason that it bugs me, nowadays customers i.e. teachers and students are using things like facebook and twitter were the UI is very clean, very smooth. And then they look at LV and they're like "oh!" So there is a disconnect there. I think that UI is the single most important thing that an application can do, because that's where the user is touching it.

*In your opinion, what is a district's technology needs? Does the technology offered by HMH or other vendors meet their needs?*

I think probably in a lot of cases it does meet their needs, particularly lessons planning. I do think a lot of products probably are built and then go looking for customers rather than the other way but I think that's across all the districts, I don't think that's localised to education in any way, you'd hear or see that problem in medical etc, that people don't focus enough on what a district needs.

Now having said that, every single district in the US is different, they're all going to perceive they have different needs. So it's just not possible in a cost effective manner to customise or to give them a solution that's a perfect fit for them.

So I think you're trying to balance something that's useful to them with something that's generic across all. So there's always going to be a little bit of lowest common denominator involved in that. But I don't see that necessarily as a bad thing. Because 1 of the things that LV does very well for example is that it forces people to collate their data in a regimented fashion. The negative about that for the district is that it's a pain to do that, it's a lot of work. The advantage is that it's easier to get at, because it's now standardised and you can now search on things and pull data up. So there are pluses and minuses to everything.

*You mentioned about being good at keeping on top of patches. Is that by design?*

I think it's part of our build cycle, so I think that because Microsoft …as you know Microsoft has a patch 2 set, so they can draw back patches whenever. It took us over a year to get an LV version certified for SP2. I mean SP2 was released in April 09, and we're about to get our version which supports SP2 out a full year after that. So that's a long time! Especially when Microsoft's recommendation when they release a service pack is basically patch it now. Having said that, Moss SP2 was a disaster, and if you had patched it immediately after you would have been crying because they pulled that patch and did a re-release of 2.2 about a month and a half later, because it had broken so many servers. But that's neither here nor there. Microsoft on their official support page says that "we will

support Moss SP1 up to a year after Moss SP2 is released". So right now no SP1 systems are supported.

*So is relying on Microsoft to release patches or SPs etc a disadvantage?*

Well you see it with any application; you see it with any provider, so we had the same thing with LV 1.8 were we relied on IBM BB2 patches. I guess one of the advantages in being fairly vendor agnostic is you don't have this great reliance on patches. What I do think is that the way to fix patches releases is to have a very strong automated tool set that you can run overnight without having users to sit at the keyboards, that can give you back yes/no answers to all of your tests. So you can run it, and 8 hours later this new set of patches applied?'

One of the biggest problems we have internally in HMH is that so many of our products are manually tested. It kills us from a how fast we can turn things around, because our QA cycle for LV is a minimum of 2 weeks. That's murder – we're lucky we're in the educational world because it's not murder here, but if we were in a business world...2 weeks to do anything is insane.

*Would you use SharePoint again, knowing what you know now?*

I would not use SharePoint. That was the argument that I had 3 years ago, and I would stay with that argument. And I will say that I don't have visibility to how much smoother the development process is, how much easier it is from the development side, I just see the increased complexity in deployment, and I see the perceived increased slowness on releases. I actually think that the best model we have out there for any of our products is something like Aerobics, which we drop as a black box into a district, and we configure it and that's it!

**Interviewee:** John Sinnott

**Title:** The Project Management of Learning Village

**Interviewer:** Eoin Murphy

**Date:** 30 March 2010

*What was your role in HMH?*

My original role in Learning Village was LV product manager, also known as Executive Producer, also known as Senior Product Manager.

I'm now working as director of product operations

*What's your background?*

I've been in the eLearning industry since 1996, and a project manager since 2001/2002.

*Ok, what needs to happen to SharePoint to turn it from an off the shelf product to a learning Village application?*

A miracle, we had a very detailed set of requirements for what Learning village needs to do. We cross referenced those requirements against the out of the box features from SharePoint. There were some very obvious quick wins like permissions, deep linking portals, calendar features, they were very helpful. Things like email were working very well. Other features weren't really off the shelf but customised, and finally some things were built from scratch, in this case the calendar features for LV. So it was a threefold approach.

*So you mentioned there were a set of requirements. So you probably approached this same as any other projects…?*

So, you have your set of requirements, and at the standard process stage you cross reference those, you do a scoring matrix against all in the market. You rate all the features against them: easiness to use, to fill, cost, market liability, scalability, productivity and all that good kind of stuff. From there you get give it a score, and you make a decision based on that for which product to go forward. In this one we actually started a project with SharePoint in mind, and we double checked that it was feasible to build our new LV features into SharePoint, rather than the other way around. It wasn't a case of what's best in the market. The only other option we had at the time was to build dot net 3.0 from scratch, and it was a case of what % do we go from ground up building or do we take directly from SharePoint.

*Was there anything else that was different from a general development life cycle?*

We actually in this project tried to build it 2 different ways – we tried scrum methodology, what's it called these days? Agile. We tried Agile, and the classic waterfall model. It turned out the Agile model failed, but the huge strength in Agile was flexibility, when you had a detailed set of requirements the key reason for using Agile was default and our process can fully start the project over again. We took a classic waterfall model of fine, analysed, developed, test waterfall. Just for very restrictive timelines and pressures, we actually took an iterative waterfall life cycle model for which we had several deliverables, key milestones. And each milestone was actually a key set of functionalities which as opposed to classic waterfalls which you actually code fully till the end.

*As you were building on SharePoint was the time to market greatly reduced as opposed to building from the ground up?*

We couldn't have built it from the ground up. Not with the time pressure we had, we started production on the 21$^{st}$ January, and we were complete, and had passed testing it and had secured the key stakeholders on the 11$^{th}$ July. And it was done mainly by lifting key features from SharePoint.

*How long would it take to have a similar type product built from the ground up?*

In SharePoint if we'd used that as our constraint – same teams as everything else, it would have been 18 – 24 months vs. doing it in 5.

*The development model that you used in HMH is it developed in house or is it outsourced?*

The first project I was involved in it was whole developed outsourced and managed by the engineer / architect in Dublin.

*And was it a challenge to identify people with that particular skill set?*

At the time yes, as it was brand new technology, brand new to the market. A lot of people believed they could do it but very few actually could. It was done through an aggressive vendor process were the engineering architect, project manager; QAD management team met with the various vendors and interviewed them, quizzed them and made a selection.

*And did you find a lot of companies around who did this?*

Off the top of my head, there's probably hundreds of suitable dot net vendor partners and when we trawled through we probably came across about 4, we usually had a list of about 80, we narrowed it down to 4 very quickly, and from that 4 we actually only had 1 that was suitable. And we got lucky with their price and their rate and their availability.

*And were they more expensive?*

Because it was new to market yes, much more expensive. We could have built it with a much larger team, offshore in Asia for cheaper.

*What level of QA was the LV application subjected to? Was it more or less stringent that the other platforms that go out?*

The QA for this project was standard QA methodology based off QIT / CIT? But essentially what happens is you get your current product market requirements, you don't look at the avocation, from there you generate a series of test cases. For this product came up 800 or 900 test cases, all with 3 possible results from each one – a positive result, a negative result or a middle of the road result. Then it was sent on to a vendor who put the application through its paces. Challenges on that were the classic challenges of trying to go from paper based use cases to actually see in front of you. Like the end user acceptance was very important, as the marketer was the 1st one to have a true understanding of what division she wanted. The QA weren't able to translate that in the original test cases. They still

managed to find in the region of a thousand odd bugs going through test cases, so it was effective from that perspective. We made an assumption that SharePoint was scalable and robust, as it was Microsoft technology, and looking back that was a large mistake. It didn't prove that way in hindsight.

*So QA approached this in the same way as any other product, that didn't change. And you made some assumptions around performance and saleability?*

Our non function testing to be fair was a disaster.

*Was that because you trusted the Microsoft brand?*

Bit of that and the other thing we discovered was that we didn't actually fully appreciate the challenges in building the environment ourselves – to do it through performance testing and through inflation testing. We made certain assumptions that...and it turned out that even Microsoft themselves had a challenge getting the environment out, and still do.

*So what are the challenges in turning scope into reality? Were there certain aspects you had to go the custom route on or was SharePoint a good fit?*

To be fair once we get into the project, we uncovered that SharePoint was not as good a fit as initially thought, and certain features require a lot more custom work than initially planned. That would have been along the screen were you can view all the content items, if you just look in there we wouldn't appreciate from a cursory glance, one would assume they were, in hindsight. There was other features like the calendar that were actually lead architects and engineers came to the conclusions that SharePoint was not scalable for the calendar we needed

so they built it from scratch. And that's a classic example of where true engineering management comes in.

*So did finding out that the calendar didn't fit after configuration / development was started, did that pose a challenge to hitting the date?*

Well we had the option of going with the calendar that was there and run the risk and re-engineer it at a later date. But the engineering team themselves felt that it was possible to meet that and meet the deadlines

*So was the product solely for the US market?*

No, it looks like it was in the end, but initially we had full localisation features as part of the requirement. Left to right, top to bottom and multilingual. Again we assumed because it was a Microsoft kit we could take a lot of features off the shelf and it would be the case of updating a simple language pack. It didn't prove that easy in hindsight, and it was something that was actually missed from the original. I imagine that comes from the fact that we were solely targeted on the US market, and hence so was QA.

*So was that a challenge that was discovered during the development stage?*

I don't know if it was actually a challenge, or was it actually an oversight or mistake. I don't know if they had a lot on their plate, and the purely just forgot about it.

*What were the lessons learnt?*

Never again do a project this big in 5 months time period. Timelines is the biggest challenge. There was a drop dead date, the scope couldn't be moved. Classic project management you always have something that can give. Schedule or scope in this case, neither could. So it was a huge challenge. Probably because of that we didn't have time to performance test every single piece, and make sure everything was robust so we had to take a lot of stuff at face value.

*Was there a positive lesson learnt – i.e. if SharePoint wasn't there you wouldn't have made the timelines?*

If SharePoint wasn't there you'd have a totally different model, you'd have been building in dot net you'd have had a bigger team…SharePoint had a positive effect because it actually helped us reduce costs and helped us hit a deadline.

*So it helped you reduce cost because there was a shorter development period, but the cost per day was probably higher given that it was a unique skill set?*

Correct. But it was still cheaper overall. However that was short term. Long term looking back, it's been a lot more expensive to maintain and upgrade and move forward on. It's hard to customise, whereas if you built it from the ground up you'd have more flexibility and it would be easier to add customer features in.

*Why is it more costly to maintain this product?*

Well we've got an underlining technology on top of 3$^{rd}$ party? So for example any time they do a point release there's an upgrade, there's a service pack release, we run the risk of breaking some of our core code. And vice versa, every time we release a new piece of code, make sure to proof it for vision, but also for the departments vision, for example classic obsolesce SharePoint 2010 is on the way, which is going to make our current build on management pretty obsolete or redundant, I don't actually know. That's one aspect of it. Another aspect is we had a custom team of developers. The technical support didn't have the same skill set and were relatively new to the SharePoint. The technical support team were unable to properly troubleshoot issues and this resulted in the development team doing tier 2 product supports.

*So that has a knock on effect on cost in terms of up skilling?*

Yes – long term yes.

*Within the budget were there any unusual items that had to be cased for?*

Well the biggest challenge we had was we went from a 1.8 to a 2.2 version of content to make the features map. So I suppose the whole UI should have been something that should have been managed and it turned out to be a total new look and feel. And that UI actually increased the efforts to make SharePoint look and feel the way a UI is supposed to operate. Oh yes, specialist performance testing SharePoint. – It turned out from a performance perspective, kind a few standard or current tool set of. It was very hard to resource the specialist skills, particularly with the budget we had, we probably ended up getting the wrong person for it.

*Were development costs more expensive? Skills we've covered support yes...*

I'd say it's probably 25 – 30% more expensive. And if you compare it to an offshore Indian model its probably 1000% more expensive!! You're talking 100$ a day versus 800. 800% more expensive!

*You didn't have the comfort level to do that in the 1$^{st}$ place? Source an offshore skill set?*

Skills and time didn't allow us to do that. We had to get the best guys and pay a bit more for that.

*How about licences?*

That burnt us big time – I'd say Mary has more info on that. Initially that was not factored in at all; they had this theory that it would be...especially the codes agreed with Microsoft. And Microsoft has taken a very strong stance that they want their fair share of all commission, Very expensive. Not sure about details, it seemed to change every week – think it depends on the district.

*What about the licences for the development cycle? Did you have to get special SharePoint licence?*

No, that was all cared for. We had to buy a specialised kit for performance testing, but to be fair we would have had to buy that anyway, no matter what

SharePoint's fault. How about that other framework — SLK? That was actually all free. No, I was thinking of telerik. That would have been an extra cost.

*Did you feel you had to lean more on Microsoft for support compared to a traditional dot net development project?*

Well it turned out that this time our vendors did more than the Microsoft did for support in the development life cycle. We again paid premium, and got very lucky. Ongoing support looking forward has proved that our current field team work. If we were tying back it'd have been way different probably, it would have been personal score matrix that would have been the selection process.

*Do you think LV is a success?*

Yes 100%, from the perspective of its initial requirements. From schedule, scope, yes. But again I was on the "short term game and long term pain" scenario, part of the development life cycle. I couldn't talk through the challenges they've had in the last year or not.

*Was it a success from a Project Management perspective?*

100% yes

*Does one version of LV meet all customer requirements or would you have to get into multiple versions?*

Multiple versions, but that was designed from upfront, that was originally the predecessor 1.8, had our sales model supposed to be highly customised, it was actually part of the function spec. There might have been an area of custom lesson plans; you could change the landing page, home page that ends of stuff. We weren't actually changing the essence of what LV was, changing the field, that kind of inherited form the predecessor.

*Were any features dropped because SharePoint couldn't cater for them?*

Actually no, the opposite happened. Features we didn't want initially we ended up with, for example discussion boards. Actually no, kill that, Rich text editor...remember at the very start I was talking about the reasons we picked SharePoint – out of the box stuff that were a huge win, because the 1.8 did it all by HTML coding. So features there were discussion boards, forums, all the collaborate we got from SharePoint that we didn't have on 1.8, actually all the collaboration is brand new – it's a huge win for us!

*If you were to turn back the clock would portal based software like SharePoint be chosen for LV?*

With the timeline we had and the budget we had, I'd absolutely change nothing. At the end the project was a success. If you had larger budgets or longer time, yes you'd probably look at a more custom solution. You'd do a proper field trial and all that kind of stuff and get a lesson learnt from that. I wouldn't change anything.

*Eoin explains Frank's response and his opinion.*

Would I recommend? Going forward? Absolutely no way, you need to own your own code from a licence perspective and a road map perspective you can't be relying on a 3$^{rd}$ party.