

Managing Intellectual Capital and Intellectual Property within Software Development Communities of Practice

Andy Williamson

Wairua Consulting Limited, New Zealand

David M. Kennedy

Hong Kong Institute of Education, Hong Kong

Ruth DeSouza

Wairua Consulting Limited, New Zealand

Carmel McNaught

Chinese University of Hong Kong, Hong Kong

INTRODUCTION

In this article, we will develop a framework for educational software development teams that recognizes the conflicts and tensions that exist between the different professional groups and will assist software teams to recognize the intellectual capital created by individuals and teams. We will do so by recognizing the inherent relationship between the tangible elements of intellectual property and the intangible organizational assets that form the basis of intellectual capital and by discussing how knowledge generated by a project team can become an explicit asset.

BACKGROUND

Universities are increasingly becoming developers of complex software-based applications. In-house development ranges from teaching aids and online learning resources to large information systems products that could ultimately become successful commercial ventures. Increased product complexity is easily recognized, yet research shows that the organizational aspects of a software development project are more likely to affect performance and outcomes than technical issues (Xia & Lee, 2004). Successful development and deployment of today's complex educational systems and environments comes with an imperative for an array of different and unique skill sets for the various stages of each project. One can

view a software development team as a microcosm of the wider community of practice of software development professionals who work in information and knowledge management in higher education. As Wenger (1998) observes, such communities of practice are not random but constructed around required skills and through a process of negotiation based on mutuality and accountability.

Workforce mobility has increased: academic staff members regularly and easily move between institutions; development and design staff have many opportunities for contract-based work, move to other academic institutions or into the private sector. The ideas that lie behind a successful process or product are increasingly drawn from a wider pool of talent and, as people move around, these ideas are being taken with them and disseminated through informal and new work practices into a wider community of practice. How then does a team, formed to design and develop a technology-rich educational or systems environment, manage and control issues of intellectual capital and intellectual property such that all of those who contribute throughout the life of a project are acknowledged and rewarded fairly and appropriately for that contribution, even after they have left the project?

Team Formation and Relationships

Additional complexity leads to specialization (Jacobson, Booch & Rumbaugh, 1998). New ways of

working bring with them a shift in power, where the academic expert will often lack the technical skills, time or resources to turn ideas into reality. Instead, they must rely on a team of experts from other disciplines to interpret their ideas, evolve them, and deliver the finished product. As complexity increases, communication between team members becomes paramount; specialist educational designers are required to translate pedagogy into functional specifications that can be understood by software developers and graphic designers. Modern software teams are project-based, where resources come and go as required.

Software development communities of practice exist within a larger organizational context. Roles and responsibilities will vary and are negotiated depending on the toolset and architecture used, the size of the project, and the culture of the organization (Phillips, 1997; Williamson et al., 2003). Project team members can be full- or part-time employees (academic or

non-academic) or contractors retained specifically for the project. As such, these roles exhibit complex relationships and interfaces between each other and the project. In Figure 1, a range of typical roles and relationships found in a tertiary education software development project are shown.

During the various stages of the development process, various players move into prominent roles. One way to illustrate this shifting set of work responsibilities is to list the main players at each stage of the process. We will do this using the classic instructional systems design (ISD) model (Dick & Carey, 1990) as it is so well known. (There are many other models, many of which are discussed in Bannan-Ritland, 2003.) The key players at each stage of the ISD model are listed in Table 1. In reality, each team parcels out the work depending on the skill set of individuals in the team.

It is important to be aware of the different communities of practice that exist in this field and ensure that the role of individual team members is able to be

Figure 1. Intra-project relationships in software development teams (Williamson et al., 2003, p. 345)

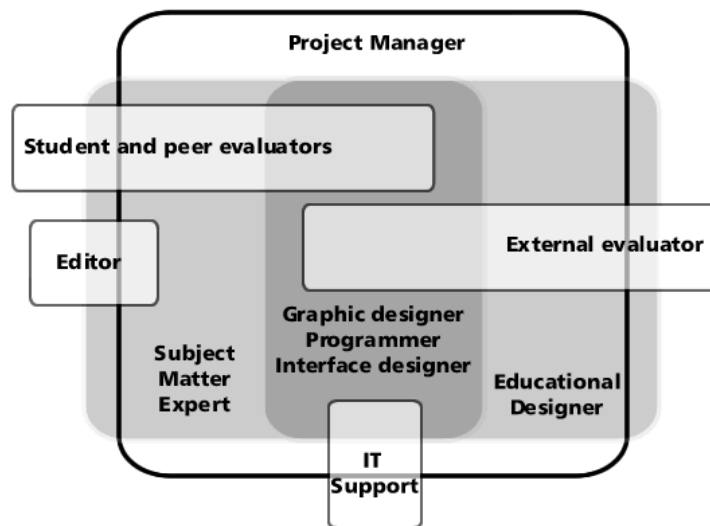


Table 1. Key players at each stage of the ISD model

Stage of the ISD model	Key players
Needs assessment	Subject matter expert
Analysis	Subject matter expert, Educational designer
Design	Subject matter expert, Educational designer, Project manager
Development	Project manager, Graphic designer, Programmer, Interface designer, Editor
Formative evaluation	Student and peer evaluators, Subject matter expert, Educational designer
Revision	Project manager, Graphic designer, Programmer, Interface designer, Editor
Implementation	Subject matter expert, IT support
Summative evaluation	External evaluator
Maintenance	IT support, Subject matter expert (Interface designer)

9 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/managing-intellectual-capital-intellectual-property/10516

Related Content

Thinking in Virtual Spaces: Impacts of Virtual Reality on the Undergraduate Interior Design Process

Elizabeth Pober and Matt Cook (2019). *International Journal of Virtual and Augmented Reality* (pp. 23-40).

www.irma-international.org/article/thinking-in-virtual-spaces/239896

Seeking Accessible Physiological Metrics to Detect Cybersickness in VR

Takuro Magaki and Michael Vallance (2020). *International Journal of Virtual and Augmented Reality* (pp. 1-18).

www.irma-international.org/article/seeking-accessible-physiological-metrics-to-detect-cybersickness-in-vr/262621

Culture in Virtual Communities

Li Xiao (2006). *Encyclopedia of Virtual Communities and Technologies* (pp. 102-104).

www.irma-international.org/chapter/culture-virtual-communities/18052

RSS in Virtual Organizations

Tom Chan (2008). *Encyclopedia of Networked and Virtual Organizations* (pp. 1393-1398).

www.irma-international.org/chapter/rss-virtual-organizations/17769

Knowledge in the Modern Organisation

Paul Hildreth (2004). *Going Virtual: Distributed Communities of Practice* (pp. 1-6).

www.irma-international.org/chapter/knowledge-modern-organisation/19311