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## Arbeidsmarktbehoeften Art & Technology

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Publicatie in het kader van het Interregproject Goesting in Leren en Werken (GoLeWe) Thema 3 Samenwerken met het werkveld in het belang van onderwijs en arbeidsmarkt **Actie 3.1.: Projectenbureau** -

**Indicator 3.1a: Analyse arbeidsmarktbehoeften van de opleiding Art & Technology, NHTV Internationale hogeschool Breda**

## Het GoLeWe-Project

‘Goesting in Leren en Werken’ is zowel de rode draad als de uitdaging van dit project. We willen bereiken dat jongeren hun kwaliteiten kunnen uitbouwen tot competenties die nodig zijn in de maatschappij en in het werkveld. En dat onze jong afgestudeerden werk vinden dat aansluit bij eigen mogelijkheden, motivatie en ambities en bij het vinden van een plaats in de maatschappij.

De projectacties zijn gegroepeerd in drie thema’s: een vlotte overgang naar het hoger onderwijs, leren in het hoger onderwijs en samenwerking met het werkveld. Concrete acties richten zich op het verbeteren van leercompetenties, op studiekeuzebegeleiding en op leertrajecten die afgestemd zijn op de mogelijkheden van studenten. Er gaat ook aandacht naar studententutoraat en naar competentie management. Acties die bijdragen tot een betere afstemming en samenwerking tussen onderwijs en arbeidsmarkt, zijn: werkplekleren en de uitvoering van werkveldopdrachten door studenten, co-creatie van onderwijs en facilitering van de combinatie werken en leren. Goesting in leren en werken gaan hand in hand. Want de nieuwe werknemer is een kenniswerker die zichzelf blijft ontplooiën.

## Abstract publicatie

As part of the accreditation process, NHTV, Academy of Digital Entertainment is seeking to review the production pipeline and professional competency profile for the current International Game and Architectural Design (IGAD) programme. Additionally the academy wishes to establish comparable competencies and a production pipeline model for the new Art & Technology for New Generation Entertainment (A&T) programme commencing in September 2009.

IGAD’s competencies and production pipeline were internally reviewed with seven IGAD teaching staff. Based on this feedback, the production pipeline and 24 competencies were individually amended. This version was then tested externally with 3 Dutch games companies through a structured interview questionnaire. Competencies were measured for importance and frequency of use during the production pipeline process.

Similarly, a structured interview was conducted with 17 Dutch and Belgian interactive media companies to measure the importance and frequency of use of 16 proposed competencies and to obtain feedback of the proposed production pipeline model. This model was largely based on UK Skillset’s occupational standards and functional map (2004, 2005).

Results of the internal review and market research indicate that most of the competencies were identified as important and used at some stage during the development process. However, the configuration of the production pipeline model changed considerably for the A&T program’s proposed model and somewhat less for the IGAD model.

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## Abstract

As part of the accreditation process, NHTV, Academy of Digital Entertainment is seeking to review the production pipeline and professional competency profile for the current International Game and Architectural Design (IGAD) programme. Additionally the academy wishes to establish comparable competencies and a production pipeline model for the new Art & Technology for New Generation Entertainment (A&T) programme commencing in September 2009.

IGAD's competencies and production pipeline were internally reviewed with seven IGAD teaching staff. Based on this feedback, the production pipeline and 24 competencies were individually amended. This version was then tested externally with 3 Dutch games companies through a structured interview questionnaire. Competencies were measured for importance and frequency of use during the production pipeline process.

Similarly, a structured interview was conducted with 17 Dutch and Belgian interactive media companies to measure the importance and frequency of use of 16 proposed competencies and to obtain feedback of the proposed production pipeline model. This model was largely based on UK Skillset's occupational standards and functional map (2004, 2005).

Results of the internal review and market research indicate that most of the competencies were identified as important and used at some stage during the development process. However, the configuration of the production pipeline model changed considerably for the A&T program's proposed model and somewhat less for the IGAD model.

It is recommended that the A&T production pipeline and professional competency profile model is broadened to encompass the IGAD model, given that the games sector is a specialised component of the broader Interactive media industry.

## Chapter 1 Trends in the Digital Entertainment and Media Industry

### 1.1 Introduction, the broader picture

Currently there is a global explosion in the use of the internet, new technologies and devices. Platforms such as television, the internet, electronic games and off line multimedia are converging so that online and virtual environments are increasingly being used for entertainment, information and advertising through interactive virtual worlds, on-line communities and mobile devices (PriceWaterHouseCoopers 2006). In the latest publication for the Netherlands, Price Water House & Coopers identifies that this acceleration of technological developments and huge increase in the availability of broadband places consumers in a very powerful position (2009). The digital entertainment and media industry is now mostly driven by demand rather than supply and a trend of convergence is taking precedence in the once delineated media and entertainment sector.

Not only are emerging entertainment applications growing expediently to meet the current market demand, they are also creating new consumers and behaviours. To illustrate, video game development technologies are now being used to develop training simulations, visualisation applications and teleconferencing tools. Games are also becoming powerful advertising tools for an increasing range of target audiences. With the increasingly frequent release of new communication and entertainment devices, new behaviours and entertainment cultures are emerging.

To summarise, Newman identifies four emerging trends in the digital entertainment sector (2009). These are as follows:

1. Social media e.g. social media applications such as Facebook, Hyves
2. Streaming video applications e.g. YouTube
3. Mobile devices and applications e.g. iPhone
4. Intelligent online services e.g. mashups such as [Chicago crime map](#)
5. Serious games e.g. training applications such as [Sharkworld](#)

Given these current trends in the industry, there is an increasingly high demand for new generation multi-skilled employees who are able to negotiate and capitalise upon this rapid flow of technological changes. These employees require cutting edge web-based visual, conceptual and functional design and production skills as well as the broader attitudinal competencies such as the ability to create value for consumers and to be innovative, entrepreneurial, self starting and flexible.

### 1.2 The Interactive Media Industry

For the purposes of this research, the interactive component of the broader digital entertainment and media industry has been identified as the context for developing the competencies for the Art & Technology for the New Generational program. Skillset aptly defines interactive media as follows:

*"Interactive media refers, broadly, to digital media with which the user actively interacts in order to change or affect their experience, and which can only be experienced through interaction. These products are distributed to devices either via a network or on physical media". (p 4, 2005)*

Skillset, the UK Sector Skills Council for Creative Industries describes the interactive media industry as a very fluid sector with many overlaps with, and blurred distinctions between, other sectors. As interactive media products become more sophisticated, their development increasingly has greater overlap with the software and IT sector. As **convergence** gathers pace, the boundaries between interactive media and other forms of digital media also become



more blurred - particularly as television broadcasters and the marketing sector look to multi-platform, '360 degree' commissioning type models (Skillset 2005).

The European interactive media industry is worth several billion Euros annually, but its products contribute to, and even underpin, a number of significantly larger markets and economies. This is taking into account those who enable it, buy from it and, in turn, are enabled or supported by it. The biggest of these are e-commerce and online advertising.

Defining the sector is difficult not only because of the pace of change, but also because there are many companies and individuals involved in interactive media who more accurately fit within other sectors. It is important to not only consider what the sector does and who for and who by, but also acknowledge other stakeholders who operate in the grey area at its fringes. Therefore Skillset identifies that in many ways it is not so much a sector as a **discipline**, as its creation and use is increasingly becoming part of everyday activity across all sectors of industry in general (2005).

Skillset (2005) summarise the interactive media sector as one that:

- Is driven by government, business and consumer commissioning/purchasing;
- Comprises companies, departments and individuals;
- Undertakes a range of fundamentally creative activities;
- Draws on and overlaps with a number of related disciplines and sectors;
- Delivers interactive products to/via a number of technical and content platforms;
- Develops products that are used for information and commerce, entertainment, and learning.

### 1.3 Analysis of Labour Market/Jobs

Skillset found that the interactive media sector in the UK is estimated to comprise approximately 10% of the total audio visual workforce (2005). The sector is heavily reliant on freelancers and contractors, who are estimated to account for around one fifth of the workforce.

In the Netherlands & Belgium, this industry is significantly smaller however it seems that demand in the Netherlands for interactive media employees is accelerating. Over a 12 month period in 2008, an average of 200 jobs requiring skills in "Flash" (software development tool) a month were found on the Dutch job website, *Monsterboard.nl*. It can be noted that the number of jobs advertised increased across this period (Newman 2008).

The UK workforce in the interactive media industry is generally very highly qualified. 30% hold a postgraduate qualification and a further 50% hold an undergraduate degree. Hence in total, around 80% of the workforce are higher education graduates (Skillset 2005). A similar trend is expected in the Dutch and Belgium interactive media sector. The qualifications required for interactive media jobs in the Netherlands and Belgium is one component investigated in this market research.

#### 1.3.1 Skills, Attitudes and Knowledge required in the Interactive Media Sector

Skillset found that the titling of job roles vary significantly within the sector. Titling of job roles largely depends on company size and the need to employ a number of new skill sets across projects on a case by case basis. Interactive media therefore requires a broad range of cross-disciplinary skills (2005).

#### *Skills*

Practitioners in this sector typically need a combination of specialist skills drawn from at least two of the creative design, technical, content and business disciplines, and also a range of more general work-life skills (Skillset, 2005). For example, an interactive media account manager needs to have at least some understanding of the technical and creative issues inherent in the production process; a designer needs to understand both the project's technical constraints and its business objectives; a web programmer needs to be aware of usability and design issues.

A mixture of transient, enduring and transferable skills is also required. Specialist transient skills include, for example, expertise in particular software packages, hardware platforms and other technologies, which may change or develop over time. Specialist enduring skills underpin these transient skills and provide an essential foundation for long-term career development. They include, for example, high-level understanding of broad design theory (encompassing product, audio, information, visual, interaction and systems design); software programming principles and creative and concept development abilities. More general transferable skills include personal and work skills (such as communication, presentation and time management); self-management; research and study skills; and use of information technology.

### *Attitudes*

The nature of the interactive media industry requires practitioners to have certain attitudes relating in particular to skills acquisition and working practices. Successful practitioners need to be flexible, adaptable, self-motivated and autonomous, with an entrepreneurial attitude and a willingness to continue learning and to go beyond their job description. It is particularly important that practitioners, both creative and technical roles, have a strong awareness of their position in the production process, and of the needs and expectations of others involved in the project. They must also be flexible and willing to work in multi-functional roles if required. They may need to accommodate unpredictable working hours, including long days. Frequent changes of employment are also likely.

### *Knowledge*

Also needed is an all-round awareness of the industry, its context (particularly relating to other sectors), processes and business issues as a whole. In particular, they need awareness of the other interactive media skill sets beyond their own specialities; users and usability; commercial and marketing requirements; and legal issues relating to intellectual property. As interactive and other digital media increasingly converge, awareness of how products and content can be created across multiple platforms is vital - in particular the way intellectual property can be used beyond its original medium. They must have a broad outlook and be willing to embrace hybrid skills and cross-disciplinary roles.

A crucial component is also experience. While some skills can be taught academically, and others can be gained through work in other industries, inevitably there are some that can only be acquired through direct experience in the interactive media industry itself. The 'interactive media skill set' has a far wider application than just interactive media. Anyone outside the sector who contributes content or uses interactive media as part of their work will need at least some of its skills. But in addition, the skill set is likely to have value across many sectors, if not the whole of industry. In particular, the combination of creative and logical thinking necessary to perform many of the cross-disciplinary functions needed in interactive media potentially makes for a valuable foundation for any job in the knowledge economy.

Finally, while individuals with deep, specific skills (such as graphic designers or programmers) are relatively easy to find, those with the hybrid or combinations of skills needed by the industry are not. Skillset observed a significant absence of cross-disciplinary awareness and understanding of role context. This need for combinations of skills, broader awareness, high-level understanding and business competencies is important across most functions. But it is especially so with respect to long-term career development. This broad expertise is essential for practitioners to progress into senior or management roles; for example, for developers to become systems architects, designers to become producers, and so on (Skillset 2005)

### **1.3.2 Roles in the Interactive Media Sector**



Table 1 provides an overview of possible roles in the interactive media/multimedia sector found in the UK and Europe (Skillset 2005; Adoue and Gluhak 2007). Not the all job tiles have been defined however these descriptions provide a general overview of key professional roles in the interactive media sector.

Table 1 Interactive media roles placed within the Art & Technology program production pipeline

Role ► Phase ▼	Concept Development	Technology	Art (Visual Design)	Management/Business/ Quality Assurance
<b>CREATION</b>  <b>Target:</b> stakeholders  <b>IMP/S-</b> Interactive Media Product/Service	<p><b>Designer</b>-creates the 'look and feel' of an IMP/S.</p> <p><b>User Experience Designer</b> <b>Game Designer</b> <b>Web Designer</b> <b>Art Director</b> <b>Media Specialist</b> <b>Visual Designer</b></p> <p><b>Content strategist</b>- scopes and plans IMP/S content and determine its overall style.</p> <p><i>1.1.1.2 Developer- creates an IMP/S</i></p> <p><b>Web Content Developer</b> <b>Scriptwriter</b> <b>Storyline Author</b></p>	<p><b>Technical Director</b> <b>Technical Lead</b> <b>Webmaster</b> <b>Cross Media Specialist</b></p> <p><b>Game Developer</b> <b>Web Developer</b></p>	<p><b>Web writer/Copy writer/Copy Editor</b>-creates text content for web sites, usually as part of the site development, though they may also be involved with on-going publishing after launch. This is primarily a journalistic role.</p> <p><b>Art Director</b> <b>User Experience Designer</b> <b>Visual Designer</b></p>	<p><b>Producer/Project Director</b>- is a senior, client-facing role that requires expertise in business, management, content, design and technical disciplines.</p> <p><i>1.1.1.1 Production Assistant- contributes to the production of IMP/S by assisting the project team.</i></p> <p><b>Project manager</b>- plans, schedules and co-ordinates interactive media development projects, ensuring they run smoothly, on time and within budget.</p> <p><b>Studio manager</b>- ensures the studio has adequate resources to carry out its work and, conversely, that the work it takes on is realistic and manageable within the available resources.</p> <p><b>Account manager</b>-develops, maintains and improves relationships with existing clients, ensuring their needs are met, and obtaining repeat business from them.</p> <p><b>New business developer</b>- often only identifies prospective clients and then hand over leads to a senior role such as an Account Manager. May additionally be responsible for winning the business by developing proposals and making pitches.</p> <p><b>Web marketing Specialist</b> <b>Quality Assurance Manager</b> <b>Tester</b></p>
<b>PRODUCTION</b>  <b>Target:</b> the customer & user  <b>IMP/S-</b> Interactive Media Product/Service	<p><b>Producer/Project Director</b>- is a senior, client-facing role that requires expertise in business, management, content, design and technical disciplines.</p> <p><i>1.1.1.3 Production Assistant – contributes to the production of IMP/S by assisting the project team.</i></p>	<p><b>Technical Architect</b> <b>Server Administrator</b> <b>Database Specialist</b></p> <p><b>Programmer</b>-produces computer software in order to give a product its functionality. <b>Flash Programmer</b></p> <p><b>Search Engine Optimisation (SEO) Specialist</b>-optimises a web site or pages to make them as visible as possible to Internet search engines, in order to maximise traffic to them.</p>	<p><b>Web editor</b>-plans and oversees the on-going management of a web site and the publication of content to it.</p> <p><b>Technical Artist</b> <b>Computer Graphic Designer</b> <b>3D Specialist</b> <b>Animator</b> <b>Flash Developer</b> <b>Interface Designer</b> <b>Modeller</b> <b>Texture Artist</b> <b>Audio Designer</b> <b>Digital Video Designer</b></p>	

<b>SUPPORT</b>		<b>SEO Specialist</b> <b>Forum moderator</b>		<b>Usability specialist-</b> ensures an IMP/S meets the needs of its intended audiences
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## 1.4 Objectives of market research

To meet the labour needs of this emerging interactive media sector, the Art & Technology for the Next Generation undergraduate bachelor degree variation is attempting to prepare the next generation of designers, producers and developers both in the local and international market. As mentioned in the previous section, interactive media practitioners typically need a combination of specialist skills drawn from at least two of the creative design, technical, content and business disciplines.

More specifically such technical and creative competencies may include tasks such as: signing an animated visual interface; working with 2D, 3D or streaming video content; producing social networking or mobile applications. It also includes other competency domains such as concept development; design; production; management; quality assurance; and business processes.

Given the broad spectrum of competencies required, the objectives of this research are: to firstly identify specific competencies that comprise the domains mentioned above; secondly, to measure the importance and frequency of these competencies in the IGAD programmes at NHTV; and thirdly to identify and qualify other competencies that may be required for the industry currently and in the future. The last objective concerns itself with obtaining feedback regarding the IGAD's current and A&T's proposed production pipeline and professional competency profile models.

On the basis of the information gathered, the current IGAD production pipeline and professional competency profile will be reviewed and a comparable production pipeline and competency profile will be developed for the Art & Technology program.

## 1.5 European competency profile models

In order to identify appropriate competencies required in the interactive media industry, much of the research focussed on European competency profile models in the creative industries/multimedia sector. Little was found in North America or Australia in terms of sector wide competency profiles. Three models provided a starting point for developing a competency profile for the Art & Technology for New Generation Entertainment program. Each of these is summarised in the following sections.

### 1.5.1 NAME (*Nomenclature Analytique du Multimédia Européen*),

NAME, is competency model based on a Leonardo de Vinci project funded by the European Commission. The aim of this research was to develop a European Interactive Data base for the European multimedia industry (Bahry 2002). NAME was co-ordinated by Aquitaine Multimedia and was collated by many of the main European professional Multimedia associations, representing several thousands of Multimedia companies. In the process, NAME scrutinised and has evaluated 26 different jobs and 96 operational multimedia tasks. The data base is presented in 9 languages, with a database of more than 650 companies from 11 countries.

This job reference guide was presented at the *World Summit on Internet and Multimedia* in Montreux, Switzerland in 2002. The guide identified 7 occupation categories listed below across two dimensions i.e. realisation of a multi-media project and sales and marketing.

#### **Realisation**

- Project management

#### **Sales and marketing**

- Website administration

- Authoring/direction
- Graphic design/ conception and creation
- Software development
- Web marketing
- Miscellaneous

Another outcome of the project was the identification of 9 activity domains within the European multi-media sector. These are summarised below.

1. Creation
2. Implementation
  - a. Media production
  - b. Integration
3. Research, consultation and training
  - a. Research
  - b. Technical/Strategic implementation
  - c. Training & Knowledge management tools
4. Management & Coordination
5. Commercial Interface
6. Testing and validating
  - a. Testing and design validation
  - b. Testing and mediums validation
  - c. Testing and software validation
7. Documentation
  - a. Design documentation
  - b. Media documentation
  - c. Software documentation
8. Internet site administration
  - a. Technical administration
  - b. Publishing administration
9. Marketing, co-ordination and customer support
  - a. User/audience development
  - b. Evaluation
  - c. Marketing
  - d. Customer support

### **1.5.2 CompTrain (Competency Needs for formation and Training in Multimedia Jobs)**

CompTrain is based on another Leonardo de Vinci project subsequent to NAME and was funded by the European Commission. The project developed NAME's categories further (Gluhak 2006). Appendix 1 provides an overview of identified jobs and main tasks for each of the occupational categories. In this research, Gluhak measures the importance of competencies within each task with 355 European multimedia industry, training organisations, multi-media students.

One of the main outcomes from this research is that it differentiates between four categories of competences within each of the NAME's 7 occupational categories (Adoue and Gluhak 2007). These are outlined below (see Appendix 1 for further elaboration):

1. Technical competences: to perform technical aspects of a job
2. Content-related competences, to express contents by text, picture or sound
3. Management competences, to organise, plan, control and lead a team
4. Behavioural competences, as the ability to behave and interact successfully in social contexts.

### **1.5.3 Skillset (UK Sector Skills Council for Creative Industries)**

As an outcome of extensive and ongoing research with the UK interactive media industry, Skillset developed a set of occupational standards including an overview of competencies, knowledge and understanding required and performance indicators (2005). An iMedia Functional map was developed to provide an oversight of key areas, functions and competencies (2004). A shortened version of this functional map is provided in Appendix 2.

In Skillset's document, *Interactive Media Sector Profile*, these competencies are summarised into 3 sets of skills that Skillset identify as essential for working in the Interactive media industry in the table below (2005).



Table 2 Skills Matrix (Skillset 2005)

<b>Transferable Skills</b>	<b>Enduring Skills</b>	<b>Transient Skills</b>
<ul style="list-style-type: none"> <li>• <i>life skills</i></li> <li>• <i>work skills</i></li> <li>• <i>business skills</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>theory</i></li> <li>• <i>concepts</i></li> <li>• <i>programming</i></li> <li>• <i>design</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>software</i></li> <li>• <i>authoring tools</i></li> <li>• <i>platform technologies</i></li> </ul>
Communication, presentation and other inter-personal skills	Video game theory and game-play concepts	Software packages i.e. <i>Adobe Flash, Alias Wavefront, Alias Maya, Discreet 3D studio etc</i>
Time, client and project management	Information architecture and systems architecture	Authoring Tools i.e. <i>Flash, Java scripting, C++, PHP, Objective-C etc</i>
Leadership, team-working and people skills	Software programming principles	Platform technologies i.e. <i>PC, mobile, other handheld devices, interactive TV etc</i>
Business, financial, sales and marketing awareness	Script-writing, copy-writing and technical authoring	
Research and study skills, including the ability to learn new skills quickly	Design in its broadest sense (particularly including product, information, visual, interaction and systems design)	
Problem solving and concept development		
General ICT use		

### 1.6 Match of models with IGAD's current competency profile model

The CompTrain's four competency categories i.e. management, technical, content and behavioural appear to be generally subsumed in roles/learning lines identified in the IGAD production pipeline and professional competency profile i.e. concept development, technology, visual art, production/QA and audio. However it seems that Skillset's skills matrix of transferable skills (management-production/QA), enduring skills (concept development) and transient skills (technology & art) more accurately coincide with the roles/learning lines identified in the IGAD model.

In terms of the phases of the production pipeline, NAME's project's 9 activity domains have some overlap with the identified roles and phases of IGAD's model. However, NAME's phases reflects the a greater focus on producing multi-media products while the IGAD model's focus is more reflective of a film production model traditionally inherent in the development process of AAA console games. Given that the Art & Technology program has a much broader focus than console games, NAME's model encompassing a broader multimedia sector, has been a useful starting point in developing the A&T production pipeline model.

Although the competencies in the CompTrain model parallel quite a number of comparable competencies in the IGAD model, the UK Skillset model appears more transferable to the IGAD model than the CompTrain model. Skillset more succinctly articulates competencies within the developmental process while the CompTrain model simply catalogues tasks and functions into occupational categories. Additionally Skillset's articulation of competencies is much more

comprehensive and includes the operationalising of competencies into specific and measurable performance indicators. To illustrate, a competency within the software development occupational category in CompTrain is described as follows: *programming skills for the development of multimedia-applications, software, websites etc.* Skillset's comparable example of a competency under programming skills is: *analyse product information, designs and specifications to identify technical requirements and parameters.*

Accuracy and measurability of competencies are extremely important when developing competency profiles for higher education programs given that educators are eventually required to measure student's mastery of these competencies. Skillset's articulation of competencies therefore provides a useful foundation for developing the Art & Technology competency profile.

## 1.7 Development of production pipeline and professional competency profile model for the Art & Technology program

On the basis of the IGAD production pipeline and professional competency profile and Skillset's media functional map, the following model was developed to test in the Dutch and Belgian interactive media industry (see Table 3 below).

Competencies starting with a "C" (Core competencies) are the foundational skills required by all effective interactive media practitioners whether they choose to specialise in visual art or digital technologies. These competencies are what Skillset classifies as "enduring skills" and covers aspects such as; theory, concept development and design (2005). Such competencies are foundational for operating effectively in the interactive media sector and mastery of these is essential if graduates wish to advance into roles such as Designers or Producers.

The technical competencies starting with a "T" apply to digital technicians. The visual artist, however, will need to have some basic knowledge in these technical areas. Conversely, the competencies starting with an "A" mainly concern the visual artist, but the digital technician will also need to have some basic knowledge in these areas. Both skills are "transient skills" and need to be acquired and maintained through experience and use, drawing on the foundation of enduring skills to more easily adapt to new tools and technologies (Skillset 2006).

Given that knowledge can be quickly outdated in the interactive media sector, students are also required to develop "learning competencies" or what Skillset identifies as "transferable skills" (2005). Transferable skills are enhanced through experience, building on the foundation gained in education (Skillset 2006). Reflecting on and directing one's own learning process is a vital skill to prepare graduates for the industry. This competency is denoted as part of the competency G7. *Managing self and others.*

In line with CompTrain and Skillset, the *Production & Quality Assurance* learning line has been replaced with the term, *"Management & Quality Assurance"* which more aptly encompasses the Production aspect in the realisation process. An additional learning line has been added, *"Commercial Interface"* to account for business skills that are also required by the interactive media sector.

Table 3 *Proposed Art & Technology program production pipeline and professional competency profile*

Role ► Phase ▼	Concept Development	Technology	Art	Management & Quality Assurance	Commercial Interface
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CREATION					
<b>Design interactive medial product/service (IMP/S)</b>  <b>Devise content</b>	C1. Liaise with decision makers regarding the adaptation of existing design solutions  C2.Design the architecture of IMP/S  C3. Design, obtain and prepare user interfaces for IMP/S  C4. Documentation	T1. Contribute to functional design process  T2. Assess the technical implications of the design brief	A1. Contribute to the visual design of the product/service	T1. Contribute to functional design process  T2. Assess the technical implications of the design brief  A1. Contribute to the visual design of the product/service	C7. Managing self & others
<b>Create , develop and manage IMP/S to prototype</b>	C5. Plan, write and edit content for IMP/S	T3. Implement functionality of IMP/S to prototype	A2. Create Art Resources to prototype	C6. Project Management for creation of IMP/S to prototype  C7. Quality Assurance of IMP/S to prototype	C8. Commercial skills
PRODUCTION					
<b>Manage and plan the production of IMP/S to release/publication</b>  <b>Create, develop and manage software</b>		T4. Implement functionality to release/publication	A3. Produce Art Resources to release/publication	C6. Project Management of IMP/S to release/publication  C7. Quality Assurance of IMP/S to release/publication	

## **Chapter 2     Methodology**

### **2.1 Introduction**

The current International Game and Architectural Design (IGAD) production pipeline and professional competency profile will be reviewed and a production pipeline model and competencies for the new Art & Technology (A&T) programme will be developed. These competencies will be tested by measuring the importance and frequency of use of these competencies by the Dutch and Belgian interactive media industry. The investigation will also aim to identify and explore other competencies that may be required currently or in the future by industry.

Given that the market research is targeting a defined sample and is largely explorative in nature, the following methodological approach has been selected from a number of formats stipulated by Fink, in her Survey Kit 2 series (2003). This approach provides some structure to support the validity and the utilitarian value of our results and also contributes to its utilitarian value.

#### **Objectives:**

1. To provide feedback on the current IGAD production pipeline and professional competency profile model and the proposed A&T model.
2. To determine the importance and frequency of use of competencies taught by the IGAD programmes at NHTV.
3. To identify and qualify other competencies that may be required for the industry currently or in the future.

**Instrument:** Structured interviews using a questionnaire for internal review and market research with interactive media industry. The following steps are proposed:

1. Internal review of the current IGAD production pipeline model and 24 IGAD competencies with current IGAD teaching staff
2. External market research to obtain feedback of the IGAD production pipeline/competency profile model and measure the importance and frequency of use of 24 competencies with games companies
3. External market research to obtain feedback of the A&T proposed production pipeline/competency profile model and measure the importance and frequency of use of 17 proposed competencies with interactive media companies

**Design:** Descriptive- specifically cross sectional.

#### **Target populations:**

1. IGAD teaching staff, N=7
2. Senior management of Dutch Games companies, N=3
3. Senior management of Dutch (N=14) and Belgian (N=3) interactive media companies, N=17

## 2.2 Research

### 2.2.1 Internal review

The first step was an internal review of IGAD competencies. This was done by interviewing seven IGAD teachers about the current IGAD production pipeline model and twenty competencies. Interviewed from the Games Academy personnel were as follows:

- Dino Dini
- Jacco Bikker
- Brian Beuken
- Andrew Paquette
- Oliver Davis
- Stefano Gualeni
- Martin Beresford

A feedback form was used as a guide to the interviews (see Appendix 3).

### 2.2.2 External market research

Two questionnaires were developed for the IGAD program and for the A&T program. These can be found in Appendix 4 & 5 and were used in the external investigation of the market to establish what competencies industry is requiring from interactive media graduates. Eighteen Dutch and two Belgian interactive media companies participated in the research and of these companies, 70% of the interviewees were senior management. Three companies are primarily games companies (W! games, Playlogic & VStep) and the rest are a mixture of web development, serious games, advertising, educative and multimedia companies. The core business of all companies interviewed all focussed on developing and producing online products and services.

Twenty companies, the contact interviewed, their core business and key clients are listed in the table below:

Table 4 *Companies participating in the research*

Company	Last name	Role	Location	Size	Core business
<b>VStep B.V.</b>	<i>Pjotr van Schothorst</i>	CTO	Rotterdam	43	<i>PC games and serious games</i>
<b>Codeglue</b>	<i>Peter de Jong</i>	CEO	Rotterdam	10	<i>digital download games, arcade games</i>
<b>Brijlant</b>	<i>Frank Zijlmans</i>	Business Developer	Breda	8	<i>digital platform to promote local council and business activities</i>
<b>Hyves</b>	<i>Stephanie van de Mass</i>	HRM manager	Amsterdam	120	<i>online community, targeted advertising, games, gadgets</i>
<b>D-Media</b>	<i>Maartjen Heesters</i>	Internet Programmer	Breda	4	<i>web development</i>
<b>W! games</b>	<i>Mike van de Voort</i>	Development Director	Amsterdam	40	<i>console and PC games development</i>

<b>Playlogic</b>	<i>Oliver L'hermite</i>	Managing Director	Breda	70	console games, AAA games, casual games development
<b>Comm'pass</b>	<i>Barry van Nes</i>	Director	Breda	30	cross media strategy & advertising
<b>Trendwolves</b>	<i>Filip Lemaitre &amp; Polle de Maagt</i>	Researchers	Gent	8	research, trend watching, consulting
<b>Glue</b>	<i>Koen Phlips</i>	Managing Partner	Gent	12	website design, e-learning
<b>Ranj Games</b>	<i>Marcus Vaag</i>	Creative Director	Rotterdam	30	serious games
<b>2D studio in Vorm</b>	<i>Ank Klis</i>	CEO	Katsheuvel	11	advertising agency
<b>Netmatch</b>	<i>Rob Kruyer</i>	Project Manager	Tilburg	50	e-business applications for tour operators, online community-Zoover
<b>Netvlies</b>	<i>Tjeerd Machielsen</i>	Creative Director	Breda	25	website development, content management systems
<b>Little Chicken</b>	<i>Michel Sala</i>	CEO	Amsterdam	17	advertgame development, brand product campaigns
<b>Ex-Machina</b>	<i>Paul van Beukering</i>	Project Manager	Amsterdam	12	development of online quizzes, platform development for community gaming
<b>Boondoogle</b>	<i>Tom de Byrne</i>	Managing Director	Amsterdam	55	strategy, creating interactive campaigns for brands
<b>MCW Studios</b>	<i>Martin van den Berg</i>	Owner/Director	Rotterdam	22	AV productions, creative interactive products
<b>Pannekoek en de Kal</b>	<i>Ferry Gentil</i>	Partner	Rotterdam	30	online advertising campaigns i.e. Flash games and websites
<b>Webtopia</b>	<i>Rob van Beek</i>	Consultant	Amsterdam	1	consultancy in web development & online campaigns



## Chapter 3 Results

### 3.1 Internal IGAD production pipeline and professional competency profile review

As an outcome of an internal review of the IGAD production pipeline and professional competency profile, the following changes were made to the original model (see extended amended version in Appendix 3)<sup>1</sup>:

1. An addition of phase at the end of the process i.e. *Release/Publication/Deployment/Support*
2. Use of the term influences rather than phases
3. A further dimension is also included i.e. *level of input* of the roles involved in the production pipeline
4. Changes to the positioning of competencies and the incorporation of *level of input* as described below:
  - **Game design learning line:**
    - *G1. Game concept* is more of a stand alone competency found in the concept/defining stage and is highly involved in the first 3 phases but declines rapidly in the production phase
    - *G2.documentation, G3 game design and G4 narrative design* are clustered together in the design and pre production phase
  - **Programming learning line:**
    - *P1. AI programming, P2. Tools programming, P3. Game engine programming, P4. Development with constraints, P5. 3D engine programming, P6. Audio programming, P7. Platform specific programming, P8. Gameplay programming* are shifted upwards to the design stage as programming input is often required in this phase to assess the feasibility of functional specifications. These competencies peak in the preproduction phase and phase out in the middle of production.
  - **Visual Art learning line:**
    - *A1. Graphic communication* is highly involved in the concept phase and slowly declines in involvement to the support phase
    - *A2. Pipeline design* and *A3. Production design* are highly involved in the design and preproduction phase and rapidly decline in involvement in the production phase
    - *A4. World Building, A5. Advanced modelling, A6.Texturing, A7. Animation, A8. Lighting and rendering* begin to provide input in the design phase and peak input in the middle of the production phase to declines and stop in the post production phase.
  - **Production/Quality Assurance learning line:**
    - *G6. Project management* begins earlier at the concept phase and is highly involved in all the phases of the pipeline
    - *G7. Quality Assurance* begins much earlier in the pre production phase and peaks near the end of production and continues until the support phase
  - **Audio Design learning line:**

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<sup>1</sup> Acknowledgement; Dino Dini, Programming lecturer, IGAD program, provided most of the feedback contributing to these changes in the IGAD model.

- *G8. Audio design* has increasing input from the design phase, peaks in the middle of production and declines to post production. This competency is often outsourced although there is now a trend emerging where Artists are responsible for integrating sound with their graphic design.

## 3.2 The amended IGAD production pipeline and professional competency profile

The IGAD model below was presented to three games companies for feedback in a structured interview (see Appendix 4). Their responses are compiled under eight key areas in Table 6.

Table 5 Amended IGAD production pipeline and professional competency profile

Role ► Phase/ Influences ▼	Game Design		Programming Engineering	Visual Art	Production/ Quality Assurance		Audio
Concept phase	G1. Game concept			A1. Graphic Communication	G6. Project Management		
Design phase		G2. Documentation G3. Game design G5. Narrative design	P1. AI programming P2. Tools programming P3. Game engine programming P4. Development with constraints P5. 3D engine programming P6. Audio programming P7. Platform specific programming P8. Game play programming	A2. Pipeline design A3. Production design		G7. Quality assurance	G4. Audio design
Pre-production phase							
Production phase				A4. World Building A5. Advanced modelling A6. Texturing A7. Animation A8. Lighting and rendering			
Post-production phase							
Release/Publication/Deployment/Support							

Table 6 Comments provided by 3 games companies

Key areas	Comments
<b>Phases</b>	<i>use the term prototype rather than design, add Support after post production phase, add support phase after post-production has done this through publisher but will look at doing this in house in the future</i>
	<i>game design part of concept development (involve business, management &amp; creative specialists-brainstorm ideas), not distinct phase, iterative-refining capacity plan (assessing resources, risk and budget), production, post production &amp; deployment converge, Additional phase, Support-outsourced, DLC downloadable content after game is released, on community server, documentation is mainly produced in the production phase</i>
<b>Core competencies</b>	<i>G1,2,3 &amp; 5 most intensely involved prior production but is still involved in production, uses "scrum" tracking iterative system in managing the work flow, use of postcard board, commercial product and tailored to studio, small iterations of</i>

	<i>testing small prototypes in first phases</i>
	<i>Game Designer has increasing involvement throughout the phases, job to maintain vision/catalyst to evolving the ideas and building vision, checking the feasibility re audience and business, can be very involved in post production if there are some major changes imposed by 1st parties such as manufacturers i.e. changing platform, Project management is involved up to release, need team work skills, budget, risk assessment, scheduling, need to be solution focussed</i>
<b>Technology competencies</b>	<i>Has a separate engine team which works separately to the project team workflow model, have developed own technology over the years, previously based it on "reality engine" from APEC who created unreal engine. This is a cost cutting exercises and also an opportunity to tailor the engine to own needs.</i>
	<i>Involved in the concept development phase at a low capacity and this increases during the production phase and then decreases to post production</i>
<b>Visual Art competencies</b>	<i>A1 is not essential but sometimes used in the design phase</i>
	<i>Concept Artists are involved with 1/3 with preproduction and 2/3 production, outsource animation, texturing, advanced modelling mostly in Vietnam, may be in demand for 2/3 months a year, in-house artists work for marketing and sales in release phase when not on production</i>
<b>Production</b>	<i>Process: 4 Directors determine the vision for a game and the rules/constraints, this is documented and this is used by the Producers &amp; Project Teams to provide the parameters for implementation, the composition of a project team depends on the type and complexity of the game-the more assets, the more human resources are required. Development Director manages workflow and determines who goes on what team and when. Makes sure that projects are timed to maximize participation of specialists</i>
<b>QA/testing</b>	<i>QA-begin with small prototypes immediately to start testing, programmers do bug fixing (features that have worked previously that are not working) increases in intensity during production before post production when product is released and continues after post production, all the team engage in tweaking (fine tuning game) and game testers are brought in to test the usability and fun of the prototypes early in the production phase</i>
	<i>QA, time spent 1/3 on planning in pre-production phase and 2/3 on implementing the plan-start 1/3 way into production, tweaking &amp; debugging mostly occurs in post production, team is usually large in the design phase and then is reduced to the core team.</i>
<b>Audio</b>	<i>G4, used to outsource this but now this role is integrated into the development process with the Artists, has a dedicated sound engineer, requires good communication between artists and the audio programmer as they simulate each other</i>
<b>Commercial</b>	<i>main role is to support ambience of a game, outsource and in house, mainly involved in production</i>

### 3.3 The proposed Art & Technology production pipeline and professional competency profile model

Based on the Skillset's imedia functional map (2004), the following model depicted in Figure 1 has been developed for scrutiny by seventeen interactive media companies.

Figure 1 *Proposed Production Pipeline model for the A&T program*

<b>CREATION OF INTERACTIVE MEDIA PRODUCT/SERVICE (IMP/S)</b>  (of prototype)	<ul style="list-style-type: none"> <li>• Design</li> <li>• Create &amp; manage</li> <li>• Develop (to prototype)</li> <li>• Test</li> </ul>
<b>PRODUCTION OF INTERACTIVE MEDIA PRODUCT/SERVICE (IMP/S)</b>  (of finished product/service)	<ul style="list-style-type: none"> <li>• Plan</li> <li>• Manage resources &amp; risk</li> <li>• Budget</li> <li>• Schedule</li> <li>• Develop (to release)</li> <li>• Test</li> </ul>

Comments and feedback of this model are compiled below in Table 7 and summarized briefly below.

- *There is usually no clear delineation of creation and production for most IMP/Ses*
- *It is an iterative process usually in collaboration with the customer/client*
- *Prototypes are only used for complex IMP/Ses*
- *A phase/step before design/concept development is identified and is usually encapsulated by the term, **definition of IMP/S***
- *A phase after the production is also identified by a number of companies, **the support phase***
- *Planning, budgeting, managing and scheduling also occur in the first phase but is usually more strategic in nature rather than operational*
- *Technicians are often brought in the creation and development stage, Artists have less input*
- *Testing occurs throughout the process but increases in intensity before it is released*
- *Testing occurs in house and usually with the customer near the end of the pipeline process. At times it is outsourced to outside agencies for external testing as a final check although this is quite rare.*

Table 7 *Comments and feedback regarding the proposed A&T production pipeline*

<p><b>Use of prototypes</b></p> <p><i>prototype essential if have original IP</i></p> <p><i>mostly have prototypes when the product is complex, has many functions, and the end product is a sum of sub-products. Don't have prototypes when the product is simple or there is a short time frame. At times have more than one prototype at design phase</i></p> <p><i>use templates when presenting prototype (include design, create and manage, develop)</i></p> <p><i>don't use prototype, use idea</i></p>
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*iterative process of prototyping with the client*

*prototype 1, test, feedback, prototype 2, test, feedback, prototype 3 etc (depends on complexity and type of product)-"waterfall" process, reiterative*

## **Creation and production phases**

*two phases not applicable, prototype more basic, only test functionality, don't really have a prototype, just a product*

*iterative process, no distinction of creation and production phases*

*concept development is before design, also included is the managing resources, budgeting and scheduling in the first phase*

*define product as first step in creation and development, plan, set boundaries ie. time frames and budget in first phase, this step is usually conducted by senior personnel with 3 staff, senior designer, technical person and business/sales person with the customer*

*Process: Objectives, Interactive idea, Design, Management- oversee production*

*brainstorm (often use 3rd parties for this process), sitemap, approval of client*

*business analyst/project manager puts forward a proposal with a budget, scheduling and planning*

*can't separate the two phases, artificial, In prototype phase, requires Concept step above Design, number of options presented to customer*

*strategic concept is developed first, where type of campaign is first approved, look for 3rd parties to produce ideas, then design with concept development-iterative process, go through 10 cycles with client, project team usually consists of Copywriter & 2 Art Directors & Account Manager*

*First Phase: EXPLORATION & ACQUISITION exploration of concept with client , a price and deal is negotiated for an assignment, budgeting and planning is in the first phase*

*Second Phase DEVELOPMENT, facilitated by directors and/or team, step 1, Research, talk with experts, read up on content (25%), step 2, Concept development, pitch idea to team and brainstorm for ideas to small team 2-3 people usually comprising game designer, programmer and arts, can use templates, define technological and logistical parameters, concept docs including components such as game play, mechanical specifications, graphical and technical concepts, paper prototypes (25%) step 3, Specification, functional design, asset list, technical components, wireframes, trial different prototypes-experimental (25%) step 4, Production, implementing functional design, developing assets and building levels, iterative process with client especially at the end (50%) step 5, Implementation, place on server or system of client, testing debugging*

*concept development first step in phase one: brainstorm with a team of 3, different for different projects depends on interests, skills and capacity, also include budget in first phase, need to be upfront with expectations of roles and timeframes during both phase, have a clear budget*

*2 processes when there a new customer or when they need to develop a larger functionality for an existing customer, one process: prototyping and design includes planning, budget and scheduling & QA and second process is the development of the product which is lead by the production manager who manages the developers. PM moves to the back.*

*2 phases: concept development and production, additional phase, support-programmers provide further corrections, starting point for an entrance role, don't assess risk, plan, schedule and budge occurs in concept development phase, overlap concept development and interaction design which includes functional design, this first step occurs in consultation with client*

*aim in the first phase is to produce a playable demo (is fun and playable) in an alpha and beta form steps, 1. brief 2. concept 3. functional and technical design (se style guides) 4. graphical design 5. alpha version testing in-house and externally 6. Beta version*

*1 phase, 2 steps, development of product or Beta version and then Alpha version, first step, create definition document with customer- PDD (project development doc) includes design, budget, plan schedules, flow of game, game description, process planning, defining of deliverables, managing resources not always applicable*



Use BAMBA model INCEPTION: creative concept, strategy, planning, budget, have beta version that tests with customer, Add Support phase

hardly separated into two phases only exception is when have to design a tool for a customer in house, design and technical processes develop in parallel, 1. Concept development, 2. Plan budget and schedule, 3 Creative and functional design, 4 Test in house and user testing, 5. Deliver, 6. Support phase, all milestones are checked with customer iterative

Process, Definition, Creation, Implementation, Internal Delivery, External Delivery, Post Delivery

Iterative process: Phases: Idea-Concept--Business Communication 1. Use case (test with users) 2. Functional design (test with users) 3. Architecture 4. Technical design 5. Web Administration (what needs to be controlled i.e. mail, react, question, content adjustment 6. Design (test with customers) - Production

also include managing resources and risks, budgeting and scheduling in prototype phase

1st step managed by Business manager with customer, then it is passed onto Project Manager who oversees the internal process for the product and has a commercial role in ensuring that the product is going to sell, Project manager oversees all projects running and manages and handles communication with clients

Project management is involved up to release, need team work skills, budget, risk assessment, scheduling, need to be solution focussed

Design has two components: functionality of product and technical aspects of product including its constraints

## Technology competencies

skills in C++

skills in PHP, Javascript , Flash Actionscript

skills in: PHP, MySQL, Flex, Air, Flash

skills in PHP

skills in Flash

skills in Java

skills in Actionscript 3-Flash

## Art competencies

Art directors and copywriters provide the concept development phase of a campaign and then oversee production

outsource production e.g. video production, print, high end Flash

## Production

even before concept/design phase, have to set up project management implementation structure, includes, budget, schedule, personnel (management and team roles have to be determined), can also have a steering group/advisory board as first layer of accountability, then project group, working groups

project managers need to have a commercial focus and also must have an understanding of technical process and design processes

production is mostly in house, sometimes outsource content management system

project manager and production manager who work together. Project manager guards the interests of the client while production manager mainly focuses on the logistics of the implementation/production process.

## Project management tools

developed a content management system, interface is easy to work with, use prototypes and flowcharts for tools

*CMI-project management system & ACRUP-microsoft planning tools*

*uses "scrum" tracking iterative system in managing the work flow, use of postcard board, commercial product and tailored to studio*

*use Basecamp-project management software & online bookmarking service which is shared,*

*AGILE and SCRUM project management tools, use templates, meet everyday, have interactive planning, each member of team must demonstrate what has done, evaluation occurs weekly become realist and transparent, process is rigorous*

## **Quality Assurance**

*testing in the prototype stage is primarily internal*

*testing occurs in-house & with client*

*phases for testing, 1, in-house within team, 2 test with clients and users using all functions 3. test in-house again*

*separate digital agency produces prototype, implements production and tests*

*first stage of testing is in-house, then recruit testers in Romania (4), user testing: at times hires in companies for this at clients request, not always used*

*in-house team (others who are not in project team), in-house tester, get clients feedback and then released*

*bug testing in house, user experience testing is through use of a sample of the target group*

*testing is integrated throughout creation, product is split into small parts and each part is tested, develop test first and then develop part. backend software creates testing programs tests programs automatically, front end, tested manually, 1 person does this in-house*

*Testing occurs in-house in production phase with other company employees outside of the project team.*

## **Commercial interface**

*business development via account manager, balance financial restraints with maintaining quality, have to be creative*

*liquid process, require research before engage in development process, require empathy, need to understand the perceptions of user, how will receive product, concept first*

*consider needs of target group, require high end communication, require craftsmanship, how it can add value to market*

*each employee has own clients, important component of their training.*

### 3.4 Feedback of competencies required currently and in the future

Below is a summary of competencies identified as currently important and important in the future for the interactive media industry. The bolded competencies are competencies that have mentioned by more than one participant.

Table 8 *Identified competencies required currently and in the future in the interactive media industry*

Current competencies	Future competencies
<b>broad knowledge</b> of a number of technical and creative skills and <b>specialisation</b> in one skill area	<b>customer service/commercial interface</b> with publisher, external clients
<b>passionate and strong commitment</b> i.e. work is a hobby	<b>visual communication skills</b>
<b>research skills</b> i.e. ability to update knowledge and ability to share that knowledge.	<b>knowledge and skills in new technologies</b> i.e. mobile platforms, face recognition, AI applications, interactive TV, social media
<b>interpersonal communication skills</b> within team and with clients	<b>innovation and creative skills</b> i.e. ability to think outside of the box, experiment with new ideas
<b>analytical skills</b>	<b>ability to see connections</b> between technologies and platforms and find a new "edge" in the market
<b>ability to translate idea into a useable product or service</b>	<b>understanding the needs of specific target groups</b> and being able to focus on the what, why, when & how of that group
<b>team player</b>	multitasking skills and ability to keep focus
<b>programming C++ skills (games companies)</b>	networking skills
committed, not a 9-5 mentality	long term vision, commitment to company's vision
ability to take responsibility for own work	time management skills i.e. setting realistic expectations
documentation skills i.e. accurate and systematic	leadership skills
problem solving skills i.e. finding solutions to maximize usability	project management skills
ability to understand the balance between investment vs profit i.e. time vs costs	design skills i.e. need more specialised knowledge and skills for the internet, currently education is too broad to cater to the interactive media industry
customer service orientation i.e aware of W3C standards	ability to integrate Open Social standard shareware with social networks
ability to create ideas and translate them into emersive experiences i.e. augmented reality	advanced skills in: Action script 3 programming in Flash, AJAX, Objective C
ability to capture target group's basic motives and drives and utilising them in developing an entertaining experience of a brand	ability to add value to the market
ability to create an emotional atmosphere during a brief to convert customers	ability to apply skills in new technologies and know how they can add value to products
commercial skills	knowledge of front end concerns such as: useability, customer centric design

<i>time management</i>	<i>technical documentation skills</i>
<i>see the bigger picture</i>	<i>conceptual basis for implementing work</i>
<i>being able to handle feedback/take direction</i>	<i>setting realistic expectations about submission and budget constraints</i>
<i>creativity</i>	<i>being prepared to work in tools someone else has made</i>
<i>willing to learn and improve</i>	<i>develop tools for visual artists that are user friendly</i>
<i>proactive, productive and effective</i>	<i>use of editors for artists</i>
<i>being able to create and maintain preset standards with documentation</i>	<i>being able to find middle ground between technical and visual artists needs</i>
<i>cross cultural skills</i>	<i>specialised knowledge, currently education is too broad</i>
<i>ready to question and be open to criticism</i>	<i>planning skills: able to research, determine risks, set time frames, execute plan</i>
<i>up to date knowledge and skills in software, authoring tools and platform technologies</i>	<i>able to deal with politics</i>
<i>able to adapt to new technologies and processes</i>	<i>solution focussed, able to suspend ego</i>

### 3.5 The proposed Art & Technology competencies

#### 3.5.1 Core A&T Competencies

Listed below are the identified core competencies based on a selection of Skillset's occupational standards. These were tested for importance and frequency of use with seventeen interactive media companies and the results are compiled in Table 9& 10.

Table 9 *Percentage of companies indicating that the competency is important*

<b>Competencies</b>	<b>importance</b>
<b>C1. Liaise with decision makers regarding the adaptation of existing design solutions</b>	<b>100%</b>
C2. Design the Architecture of Interactive media product/service (IMP/S)	85%
<b>C3. Design, obtain and prepare user interfaces for the IMP/S</b>	<b>100%</b>
C4. Record, store and supply design documentation	82%
C5. Plan, write and edit content for IMP/S	76%
<b>C6. Project Management: Manage Intellectual Property Rights</b>	<b>65%</b>
C6. Project Management: Manage resources and assess risks required for the production	82%
C6. Project Management: Prepare budget plans for the production	94%

C6. Project Management: Plan and schedule the production	94%
C6. Project Management: Track and manage the process	94%
C7. Quality Assurance: Devise, conduct and evaluate testing	94%
C8. Managing self & others: Work effectively in Interactive Media	100%
<b>C8. Managing self &amp; others: Create effective working relationships</b>	<b>100%</b>
C8. Managing self & others: Master appropriate interpersonal, oral and written communication (English)	88%
C8. Managing self & others: Cross cultural communication skills	82%
C8. Managing self & others: Develop leadership	94%
<b>C8. Managing self &amp; others: Knowledge updating</b>	<b>100%</b>
C9. Commercial skills: Manage and market as freelancer	76%

Table 10 *Percentage of companies indicating how frequently the competency is used*

Core Competencies	never	somet imes	often	contin uously	na	nil
C1. Liaise with decision makers regarding the adaptation of existing design solutions	0%	24%	41%	24%	0%	12%
C2. Design the Architecture of Interactive media product/service (IMP/S)	0%	24%	18%	41%	0%	18%
C3. Design, obtain and prepare user interfaces for the IMP/S	0%	12%	29%	41%	0%	18%
C4. Record, store and supply design documentation	6%	18%	24%	29%	6%	18%
<b>C5. Plan, write and edit content for IMP/S</b>	<b>6%</b>	<b>41%</b>	<b>18%</b>	<b>12%</b>	<b>6%</b>	<b>18%</b>
C6. Project Management: Manage Intellectual Property Rights	24%	18%	0%	47%	0%	12%
C6. Project Management: Manage resources and assess risks required for the production	12%	12%	12%	53%	0%	12%
C6. Project Management: Prepare budget plans for the production	6%	12%	12%	59%	0%	12%
C6. Project Management: Plan and schedule the production	6%	0%	24%	59%	0%	12%
C6. Project Management: Track and manage the process	6%	0%	24%	59%	0%	12%
C7. Quality Assurance: Devise, conduct and evaluate testing	6%	12%	24%	47%	0%	12%
<b>C8. Managing self &amp; others: Work effectively in Interactive Media</b>	<b>0%</b>	<b>0%</b>	<b>12%</b>	<b>76%</b>	<b>0%</b>	<b>12%</b>

C8. Managing self & others: Create effective working relationships	0%	0%	12%	76%	0%	12%
C8. Managing self & others: Master appropriate interpersonal, oral and written communication (English)	0%	12%	18%	59%	0%	12%
C8. Managing self & others: Cross cultural communication skills	0%	12%	24%	53%	0%	12%
C8. Managing self & others: Develop leadership	0%	12%	24%	53%	0%	12%
C8. Managing self & others: Knowledge updating	0%	0%	24%	65%	0%	12%
C9. Commercial skills: Manage and market as freelancer	18%	18%	18%	24%	6%	18%

Managing intellectual property rights had the lowest percentage of participants who indicated that it was important (65%). Liaising with decision makers, designing, obtaining and preparing user interfaces for interactive media products and services, working effectively in interactive media, creating effective working relationships and knowledge updating are identified as important for all of the companies (100%). Working effectively in interactive media (76%), creating effective working relationships (76%) and knowledge updating (65%) are competencies with the highest percentage of participants use these competencies continuously.

### 3.5.2 Technical and Art Competencies

Listed below are the identified technical and art competencies based on a selection of Skillset's occupational standards. These were tested for importance and frequency of use with 17 Dutch and Belgian Interactive media companies and the results are compiled in Table 11 & 12.

Table 11 *Percentage of companies indicating that the competency is important*

Technical & Creative competencies	importance
T1. Contribute to functional design process	94%
T2. Assess the technical implications of the design brief	94%
T3. Implement functionality to prototype-Consideration of the type of technology used in terms of costs and functionality	94%
T3. Implement functionality to prototype-Consideration of authoring tools	82%
T3. Implement functionality to prototype-Code scripts and mark ups	94%
T3. Implement functionality to prototype-Program web based electronic games	94%
T4. Implement functionality to release/publication-Data analysis and data structure design	88%
A1. Contribute to the visual design of the product/service	82%
A2. Create Art Resources to prototype-Prepare user interface assets	82%
A2. Create Art Resources to prototype-use style sheets	82%
A2. Create Art Resources to prototype-create 2D animations	82%
A2. Create Art Resources to prototype-create 3D animations	82%
A3. Produce Art Resources- Produce 2D animations	70%
A3. Produce Art Resources-Produce 3D animation	65%
A3. Produce Art Resources-Produce music sound effects	70%
A3. Produce Art Resources-Create and produce video effects	76%

Table 12 Percentage of companies indicating how frequently the competency is used

Technical & Creative competencies	never	sometimes	often	continuously	na	nil
T1. Contribute to functional design process	6%	12%	24%	46%	0%	12%
T2. Assess the technical implications of the design brief-importance	12%	0%	30%	40%	0%	18%
T3. Implement functionality to prototype-Consideration of the type of technology used in terms of costs and functionality	6%	24%	12%	46%	0%	12%
T3. Implement functionality to prototype-Consideration of authoring tools	6%	46%	6%	30%	0%	12%
T3. Implement functionality to prototype-Code scripts and mark ups	6%	24%	18%	40%	0%	12%
T3. Implement functionality to prototype-Program web based electronic games	6%	36%	6%	40%	0%	12%
T4. Implement functionality to release/publication-Data analysis and data structure design	0%	18%	24%	28%	6%	24%
A1. Contribute to the visual design of the IMP/S	0%	12%	24%	46%	0%	18%
A2. Create Art Resources to prototype-Prepare user interface assets	12%	18%	24%	34%	0%	12%
A2. Create Art Resources to prototype-use style sheets	12%	29%	18%	29%	0%	12%
A2. Create Art Resources to prototype-create 2D animations	12%	35%	29%	12%	0%	12%
A2. Create Art Resources to prototype-create 3D animations	24%	24%	28%	12%	0%	12%
A3. Produce Art Resources- Produce 2D animations	6%	35%	35%	12%	0%	12%
A3. Produce Art Resources-Produce 3D animation	12%	35%	35%	6%	0%	12%
A3. Produce Art Resources-Produce music sound effects	24%	28%	24%	12%	0%	12%
A3. Produce Art Resources-Create and produce video effects	12%	46%	24%	6%	0%	12%

Producing 3D animations is a competency that the least amount of participants considered important (65%). Contributing to the functional design process, assessing the technical implications of the design brief, considering the type of technology used in terms of costs and functionality, implementing codes scripts and mark-ups and programming web based electronic games are identified by the most companies as important (94%).

The competencies: contributing to the functional design process (46%); considering the type of technology used in terms of costs and functionality (46%); and contributing to the visual design of the IMP/S (46%) are used continuously by the highest number of participants. The competencies:



creating 3D animations (24%& 24%); and producing sound effects (24% & 28%) are indicated as never used or sometimes used by the highest number of participants.

## Chapter 4 Recommendations & Conclusions

### 4.1 IGAD internal review & market research

As an outcome of the internal review, the following recommendations are made:

1. That the dimension *attitudes* is collapsed with *skills* in the competency profiles
2. That the IGAD production pipeline and professional competency profile is amended as per tables provided in Appendix 3
3. That a module for audio design, creation and production is integrated into the Visual Art stream
4. To replace the phase, *post production* with the term, *support/deployment*
5. That there is a clear delineation of front end and back end technological competencies
6. To use consistent terminology across the academy i.e.
  - a. IGAD- design
  - b. IMEM-content
  - c. A&T-concept development
7. That the IGAD and A&T production pipeline models are converged to one generalist model that caters for the broader interactive media industry

### 4.2 A&T market research: The Art & Technology program's production pipeline

On the basis of the feedback from participants, the proposed Art & Technology production pipeline model has been modified from a two phase pipeline i.e. creation and production to a four phase pipeline. These phases are primarily based on project management approaches from three Dutch companies (Boondoogle 2009, Lacomunicad 2009 & Nietvlies 2009) and are listed below. This is also in line with the modifications made to the IGAD production pipeline and professional competency profile i.e. addition of the support phase.

1. Strategy- strategy & project definition
2. Creation & Development- concept creation and development
3. Production- production, construction and/or technological implementation
4. Support- exploitation & optimisation

Each of these phases comprises different types of activities and project teams and varies in constellation across the interactive media sector (see Table 13). The type of process followed is largely determined by factors such as: company/organisation type; size; services provided, resources available; clients; target audiences etc.

Table 13 Amended Art & Technology program production pipeline & professional competency profile

IMP/S: Interactive media product or service

Role ► Phase ▼	Concept Development	Technology	Art (Visual Design)	Management & Quality Assurance	Commercial interface
<b>STRATEGY</b>					
Define IMP/S	C1. Provide creative and strategic direction for projects				C8. Business & Management
<b>CREATION &amp; DEVELOPMENT</b>					

<b>Design, create, develop and manage IMP/S</b>	C2. Create the functional design  C3. Create the visual design  C4. Create the content design			C5. Project Management  C6. Quality Assurance  C7. Management of self & others	
<b>PRODUCTION</b>					
<b>Plan, implement and manage the production of IMP/S</b>		T1. Contribute to establishing functional and technical processes to implement design  T2. Implement functionality	A1. Produce user face assets and style sheets  A2. Produce 2D&3D animations  A3. Produce sound and music effects  A4. Produce video		
<b>SUPPORT</b> Exploitation & Optimisation					

#### 4.2.1. The Strategic Phase

In this phase the creative and strategic direction for interactive media projects are defined and the product's commercial requirements and/or purpose are clarified and specified. This phase involves the elaboration of the concept and a determination of the design parameters<sup>2</sup> of the project.

A senior manager of the company usually meets with the project sponsors<sup>3</sup> to establish the design brief. In doing so, the concept is developed where content, functionality and structure of the interactive media product or service (IMP/S)<sup>4</sup> are defined. This is often through an iterative process between key senior player/s internal to the company and the project sponsor.

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<sup>2</sup> Factors that will influence or constrain the design of the product, such as the expectations and requirements of the target audience, the capabilities of the technologies being used, the nature of the product's content, and any business strategy underpinning its development

<sup>3</sup> These could include the project's client, internal or external decision makers, internal account handlers or third-party stakeholders, such as investors or publishers (Skillset 2005)

<sup>4</sup> This term is used to define the outcome of an interactive media development project. In some sub-sectors or areas of activity, other terms, such as 'solution' or 'deliverable' may be more appropriate.

In consultation with the project sponsor, this phase often culminates in a high-level business plan and includes project items such as: budget, timeframe and milestone estimates and may also include high-level functional design for the project.

#### **4.2.2 The Creation & Development Phase**

This phase involves the interpretation of high-level requirements into a detailed description of the product concept, the functional, technical, visual and content design of the IMP/S. This may specify technical elements such as: user experience, interface specification, enabling technologies and visual assets. During this phase the content of an interactive media product is also planned, written and/or edited. This could range from short user instructions to entire web pages.

This phase is often specified through documentation and comprises developing a detailed implementation plan including components such as: analysis of the market and technologies; finalisation the concept; management of resources; assessment of risks including organisational and legal requirements; preparation of detailed budgets; and planning and scheduling production/construction.

At times, a brief or guidance is written by the Project Manager in response to specifications from the Producer and is provided to copywriters, editors, illustrators, animators etc. Occasionally there may be a requirement to liaise with intellectual property specialists to obtain rights to use material owned by others.

#### **4.2.3 The Production Phase**

In this phase the implementation plan is executed and managed by the designated leader such as the Project Manager. The Project Manager and project team are required to implement the specifications of the IMP/S's functional, visual and content design and are responsible for determining the most effective means of creating/building and deploying the overall IMP/S. This is done by selecting appropriate front-end and back-end development environments and tools such as; scripting language, programming language, authoring tools, analysing data and designing data structures, interface selection, style sheets, 2D& 3D animations, sound effects, music and video.

In this phase, quality assurance management takes precedence and the Project Manager's role is to ensure that the IMP/S conforms to various international, industry and in-house standards. Their role is to facilitate QA specialists to design, conduct and evaluate user tests and ensure that the product or product design is fit for its intended purpose, is usable by its intended users, and is of sufficient quality. This usually involves both front-end (web, mobile & TV interface) and back-end (servers, databases) testing.

The IMP/S demo or prototype is often tested both in house and externally by the project sponsor and/or users. At times, larger companies with bigger budgets outsource testing to external parties to facilitate testing with users. Once the IMP/S is approved by the project sponsor, it is then ready to be deployed/released/published.

#### **4.2.4 The Support Phase**

After the IMP/S is deployed/released/published, there is a period in which the product or service is exploited and optimised. This is also the phase where most companies provide support for the product or service they have developed. An effective strategic project plan usually attributes 20% of the budget to this phase of the development process given that user preferences and needs, platforms and technologies can change quite rapidly over time and that there is an opportunity to optimise growth of the IMP/S.

#### **4.3 A&T market research: The Art & Technology program's professional competency profile**

A list of competencies from the proposed A&T program production pipeline and professional competency profile is provided in the table below and an adjacent list of amended competencies with related explanation and comments. See Table 13 for a depiction of the modified Art & Technology program's production pipeline and professional competency profile.

Table 14 Original competencies and amended competencies with explanations/comments

Proposed competencies	Amended competencies	Explanation/Comments
<b>Core Competencies</b>		
C1. Liaise with decision makers regarding the adaptation of existing design solutions	C1. Provide creative and strategic direction for projects	The original wording of this competency does not adequately cover the strategic scope required in the first phase.
C2. Design the architecture of IMP/S	C2. Create the functional design	<i>Functional design</i> replaced “architecture” to encompass all aspects of functional design.
C3. Design, obtain and prepare user interfaces for IMP/S	C3. Create the visual design	<i>Visual design</i> is broader in its scope while also including user interfaces.
C4. Documentation	deleted	<i>Documentation</i> is implicit in all of the first four core competencies so a separate competency is not required.
C5. Plan, write and edit content for IMP/S	C4. Create the content design	<i>Content design</i> indicates a focus on the design component of content. A number of companies do not write content and/or often outsource copywriters/editors
C6. Project Management for creation of IMP/S to prototype and to release publication	C5. Project Management	No clear delineation between prototype and to release/ publication
C7. Quality Assurance of IMP/S to prototype and to release/publication	C6. Quality Assurance	No clear delineation between prototype and to release/publication
C7. Managing self & others	C7. Managing self & others	No modifications
C8. Commercial skills	C8. Business & Management	This competency focuses on skills in freelancing, so this competency is not currently of great interest to most companies interviewed.
<b>Technical Competencies</b>		
T1. Contribute to functional design process	T1. Contribute to establishing functional and technical processes to implement design	This is a more accurate description of what occurs in the production phase i.e. combining the original T1 & T2
T2. Assess the technical implications of the design brief	T1. Contribute to establishing functional and technical processes to implement design	This is a more accurate description of what occurs in the production phase i.e. combining the original T1 & T2
T3. Implement functionality of IMP/S to prototype	T2. Implement functionality	No clear delineation between prototype and to release/publication otherwise no change
T4. Implement functionality to release/publication	T2. Implement functionality	No clear delineation between prototype and to release/publication otherwise no change
<b>Art Competencies</b>		

A1. Contribute to the visual design of the product/service	A1. Produce user face assets and style sheets	Visual design occurs earlier on in the development process. No clear delineation between prototype and to release/publication
A2. Create Art Resources to prototype	A2. Produce 2D&3D animations	No clear delineation between prototype and to release/publication, A1-A4 usually occurs in the production phase only
A3. Produce Art Resources to release/publication	A3. Produce sound and music effects	No clear delineation between prototype and to release/publication, A1-A4 usually occurs in the production phase only
	A4. Produce video	No clear delineation between prototype and to release/publication, A1-A4 usually occurs in the production phase only

#### 4.4 Conclusions

In line with practice in the Dutch and Belgian interactive media industry, the Art & Technology program's production pipeline has been modified to expand from a two phase model to a four phase model. However, it can be noted that the developmental process is largely iterative in nature and these phases provide only a guideline to how companies conduct their core business. As mentioned earlier, the constellation of phases and roles vary quite widely across the interactive media sector and is largely determined by factors such as: company/organisation type; size; services provided, resources available; clients; target audiences etc.

Also noted is that most of the proposed competencies in the A&T program's competency profile are identified as highly important (70%-100%) except for the competencies: managing intellectual property rights (65%) and producing 3D animations (65%). It seems that these competencies are often outsourced to external agencies or freelancers and so are deemed as less important. As an outcome of the feedback from participating companies, modifications have been made in the wording of the competencies to more accurately reflect current practices in the Dutch and Belgian interactive media sector. These competencies have been further expanded and can be found in Appendix 6.

Finally, given that the games sector is a specialised component of the broader Interactive media sector, it seems that merging of the production pipeline and competency profiles of both the IGAD and A&T programs into a broader generic format may be considered for further investigation in the future.

#### 4.5 Further considerations

In the publication, *Creating the Future: The UK Skills Action Plan for the Interactive Media and Computer Games Industries (Skillset 2006)* outlines a number of recommendations intended for new programs in the Interactive Media and Games Sector. These may be worth considering and could provide further guidance to the ongoing evolution of the IGAD programs.

1. That teaching remains relevant to rapidly changing industry needs and that what is taught needs to represent correct practice to minimise the reported need for new entrants to 'unlearn' bad habits.
2. That degree level courses retain an emphasis on enduring skills and 'learning how to learn', rather than on transient, software or platform specific ones in isolation. Any teaching of specific software packages must be in an applied context.

3. That Institutions provide or expect relevant and up-to-date professional development as a requirement for all course leaders and tutors
4. That universities and colleges have an industry advisory panel with current expertise for their interactive media or computer games courses.
5. That flexible and modular provision is available at degree level and includes the coverage of business and company management skills, as well as combinations of creative and technical subjects, and incorporates elements of workplace experience.



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## Appendix 1 Summary of Gluhak's catalogue of European competency profiles for multi-media jobs (2007)

Category	Jobs	Main tasks	Management competencies	Behavioural competencies	Technical competencies	Content competencies
<b>Project Manager</b>	Producer, IT Project Manager	<ul style="list-style-type: none"> <li>Information gathering, structuring, analysis and qualification</li> <li>Resource analysis and planning</li> <li>Production control</li> <li>Quality management</li> <li>Corporate communication</li> <li>Public relations</li> <li>Project administration</li> </ul>	<ul style="list-style-type: none"> <li>Manage, negotiate, direct, control subcontractors</li> <li>Conduct feasibility studies</li> <li>Schedule working processes and prioritise tasks independently</li> <li>Writing requirements specifications, technical specifications and reports/ratio</li> <li>Develop/ find solutions and validate their relevance and their consequences</li> <li>Analyze the relevance of choices</li> </ul>	<ul style="list-style-type: none"> <li>Ability to work in a team</li> <li>Commitment to corporate strategy, culture and objectives</li> <li>Knowing to seek and classify information on Internet or elsewhere</li> <li>Customer orientation: Being able to imagine the user perspective and to adapt decisions accordingly</li> <li>Understanding of the corporate culture, comprehension of the constraints of the other departments</li> </ul>	<ul style="list-style-type: none"> <li>Knowing how to make use of search engines on the Internet</li> <li>User skills for successful handling of multimedia software, applications, hardware, etc.</li> <li>Knowing how to optimize a site according to the requirement of search engines</li> <li>Testing / validating an application, a software and submit a report</li> <li>Programming skills for the (further) development of multimedia-applications, software, websites, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Drafting of texts, clearness, concision, orthography, grammar in the native language</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... native country)</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... foreign)</li> <li>Drafting of texts, clearness, concision, orthography, grammar in English</li> <li>Basics of law (in the field of activity, authoring rights, intellectual property rights...)</li> </ul>
<b>Authoring</b>	Author, script developer, script writer	<ul style="list-style-type: none"> <li>Information gathering, structuring, analysis and qualification</li> <li>General sketch, model ,content synopsis or functional specification</li> <li>Detailing of Hypertext links, scenarios, specifications etc</li> <li>Copy writing</li> <li>Scripting voice overs</li> </ul>	<ul style="list-style-type: none"> <li>Manage, negotiate, direct, control subcontractors</li> <li>Conduct feasibility studies</li> <li>Schedule working processes and prioritise tasks independently</li> <li>Writing requirements specifications, technical specifications and reports/ratio</li> <li>Develop/ find solutions and validate their relevance and their consequences</li> </ul>	<ul style="list-style-type: none"> <li>Ability to work in a team</li> <li>Commitment to corporate strategy, culture and objectives</li> <li>Knowing to seek and classify information on Internet or elsewhere</li> <li>Customer orientation: Being able to imagine the user perspective and to adapt decisions accordingly</li> <li>Understanding of the corporate culture, comprehension of the constraints of the other departments</li> </ul>	<ul style="list-style-type: none"> <li>Knowing how to make use of search engines on the Internet</li> <li>User skills for successful handling of multimedia software, applications, hardware, etc.</li> <li>Knowing how to optimize a site according to the requirement of search engines</li> <li>Testing / validating an application, a software and submit a report</li> <li>Programming skills for the (further) development of multimedia-applications, software, websites, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Drafting of texts, clearness, concision, orthography, grammar in the native language</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... native country)</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... foreign)</li> <li>Drafting of texts, clearness, concision, orthography, grammar in English</li> <li>Basics of law (in the field of activity, authoring rights, intellectual property rights...)</li> </ul>
<b>Graphic design and production</b>	Artistic Director  Computer graphic artist  Web designer  User friendly Specialist  3D specialist  Post Production Specialist	<ul style="list-style-type: none"> <li>General sketch, model, content synopsis or functional specification</li> <li>Choice of media</li> <li>Exemplary document selection, eg: pictures, sounds, texts...</li> <li>Design of the interface</li> <li>Detailing of Hypertext links, scenarios, specifications, etc.</li> <li>Graphical specifications</li> <li>Video specifications</li> <li>Story board Production</li> <li>User-Friendliness Implementation</li> <li>Mock-ups, prototyping</li> <li>Computer graphics and graphics</li> </ul>	<ul style="list-style-type: none"> <li>Analyze the relevance of choices (critical self reflection)</li> <li>Schedule working processes and prioritise tasks independently (time management)</li> <li>Writing requirements specifications, technical specifications and reports/ratio (clearly, precisely and detailed)</li> <li>Develop/ find solutions and validate their relevance and their consequences</li> <li>Manage, negotiate, direct, control subcontractors</li> </ul>	<ul style="list-style-type: none"> <li>Creativity and imagination</li> <li>Ability to work in a team</li> <li>Customer orientation: Being able to imagine the user perspective and to adapt decisions accordingly</li> <li>Being aware of the importance of details and precision (accurateness)</li> <li>Commitment to corporate strategy, culture and objectives</li> <li>Sensitivity and tactfulness in interpersonal interactions, cross-cultural sensitivity</li> </ul>	<ul style="list-style-type: none"> <li>Creation of graphic documents, layouts and web design</li> <li>User skills for successful handling of multimedia software, applications, hardware, etc.</li> <li>Knowing how to optimize a site according to the requirement of search engines</li> <li>Programming skills for the (further) development of multimedia-applications, software, websites, etc.</li> <li>Knowing how to make use of search engines on the Internet</li> </ul>	<ul style="list-style-type: none"> <li>Drafting of texts, clearness, concision, orthography, grammar in the native language</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... native country)</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... foreign)</li> <li>Drafting of texts, clearness, concision, orthography, grammar in English</li> <li>Basics of law (in the field of activity, authoring rights, intellectual property rights...)</li> </ul>

	Animation	<ul style="list-style-type: none"> <li>creation</li> <li>Production of illustrations</li> <li>2D Animation</li> <li>Page Make-up</li> <li>Artistic direction</li> </ul>				
<b>Software development</b>	Technical Director Software Developer Database Specialist Programmer Multimedia Integrator Tester trouble-shooter	<ul style="list-style-type: none"> <li>Analysis and programming (coding)</li> <li>Analysis and structuring databases</li> <li>Integration by using an authoring system</li> <li>Analysis and programming networks and telecommunication aspects</li> <li>Participating in technical feasibility study</li> <li>Participating in cost estimation and financial feasibility study</li> <li>Participating in qualitative estimation and feasibility study</li> <li>Participating in quantitative estimation and feasibility study</li> <li>Technological watch on processes</li> <li>Technical supervision</li> <li>Quality management</li> <li>Testing and validation of the code</li> <li>Testing and validation of the database</li> <li>Testing and validation of network and telecommunication aspects</li> <li>Testing and validation of the application</li> <li>Documentation of the code</li> <li>Documentation of the database</li> <li>Documentation of network and telecommunication aspects</li> <li>Documentation of the application</li> <li>Technical and application maintenance and updating</li> <li>Security management</li> <li>Resources optimisation</li> </ul>	<ul style="list-style-type: none"> <li>Writing requirements specifications, technical specifications and reports/ratio (clearly, precisely and detailed)</li> <li>Develop/ find solutions and validate their relevance and their consequences</li> <li>Analyze the relevance of choices (critical self reflection)</li> <li>Schedule working processes and prioritise tasks independently (time management)</li> <li>Conduct feasibility studies (technical, financial...)</li> </ul>	<ul style="list-style-type: none"> <li>Ability to work in a team</li> <li>Being aware of the importance of details and precision (accurateness)</li> <li>Creativity and imagination</li> <li>Analytical thinking and ability to develop synthesis/ ability to analyse and solve problems</li> <li>Impart/ explain technical knowledge to others, sense of teaching</li> <li>Communicating with customers or within the company</li> </ul>	<ul style="list-style-type: none"> <li>Programming skills for the (further) development of multimedia-applications, software, websites, etc.</li> <li>Maintaining / updating an application, a site, a software, a computer, a network</li> <li>Testing / validating an application, a software and submit a report</li> <li>Development and management of data bases (=&gt; language(s) of competence)</li> <li>Documenting a text, an application, the functions of a software</li> </ul>	<ul style="list-style-type: none"> <li>Drafting of texts, clearness, concision, orthography, grammar in the native language</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... native country)</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... foreign)</li> <li>Drafting of texts, clearness, concision, orthography, grammar in English</li> <li>Basics of law (in the field of activity, authoring rights, intellectual property rights...)</li> </ul>
<b>Website Administration</b>	Webmaster Website maintenance Web Content Manager Mèdiaticien	<ul style="list-style-type: none"> <li>Information gathering, structuring, analysis and qualification</li> <li>Resource analysis and planning</li> <li>General sketch, model, content synopsis or functional specification</li> <li>Choice of media</li> <li>Design of the interface</li> <li>Detailing of Hypertext links, scenarios, specifications, etc</li> <li>Graphical specifications</li> </ul>	<ul style="list-style-type: none"> <li>Develop/ find solutions and validate their relevance and their consequences</li> <li>Analyze the relevance of choices (critical self reflection)</li> <li>Schedule working processes and prioritise tasks independently (time management)</li> <li>Conduct feasibility studies (technical, financial...)</li> </ul>	<ul style="list-style-type: none"> <li>Ability to work in a team</li> <li>Creativity and imagination</li> <li>Analytical thinking and ability to develop synthesis/ ability to analyse and solve problems</li> <li>Knowing to seek and classify information on Internet or elsewhere</li> <li>Being aware of the importance of details and precision (accurateness)</li> </ul>	<ul style="list-style-type: none"> <li>Knowing how to optimize a site according to the requirement of search engines</li> <li>Maintaining / updating an application, a site, a software, a computer, a network</li> <li>Testing / validating an application, a software and submit a report</li> <li>Knowing how to make use of search engines on the Internet</li> <li>Creation of graphic documents,</li> </ul>	<ul style="list-style-type: none"> <li>Drafting of texts, clearness, concision, orthography, grammar in the native language</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... native country)</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... foreign)</li> <li>Drafting of texts, clearness, concision, orthography, grammar in</li> </ul>

		<ul style="list-style-type: none"> <li>User-Friendliness Implementation</li> <li>Mock-ups, prototyping</li> <li>Page Make-up</li> <li>Analysis and programming (coding)</li> <li>Technological watch on processes</li> <li>Technical supervision</li> <li>Quality management</li> <li>Technical and application maintenance and updating</li> <li>Security management</li> <li>Content management and updating</li> <li>Content Uploading</li> </ul>		<ul style="list-style-type: none"> <li>Customer orientation: Being able to imagine the user perspective and to adapt decisions accordingly</li> <li>Being familiar with the general business culture of the branch/ industry</li> <li>Understanding of the corporate culture, comprehension of the constraints of the other departments</li> </ul>	layouts and web design	<p>English</p> <ul style="list-style-type: none"> <li>Basics of law (in the field of activity, authoring rights, intellectual property rights...)</li> </ul>
<b>Web marketing</b>	<p>Audience Developer</p> <p>Web Marketing Specialist</p>	<ul style="list-style-type: none"> <li>Corporate communication</li> <li>Public relations</li> <li>Creation of new customers for services</li> <li>Creation of new customers for products</li> <li>Customer relationship development</li> <li>Content Uploading</li> <li>Meta-tagging</li> <li>Newsgroup and website moderation</li> <li>Measuring access</li> <li>Statistical studies</li> <li>Profiling visitors</li> <li>Making recommendations</li> </ul>	<ul style="list-style-type: none"> <li>Schedule working processes and prioritise tasks independently (time management)</li> <li>Develop/ find solutions and validate their relevance and their consequences</li> <li>Analyze the relevance of choices (critical self reflection?)</li> <li>Measuring and characterizing the audience and to draw appropriate conclusions</li> <li>Budget planning</li> </ul>	<ul style="list-style-type: none"> <li>Analytical thinking and ability to develop synthesis/ ability to analyse and solve problems</li> <li>Knowing to seek and classify information on Internet or elsewhere</li> <li>Customer orientation: Being able to imagine the user perspective and to adapt decisions accordingly</li> <li>Winning new customers and customer retention</li> <li>Understanding of the corporate culture, comprehension of the constraints of the other departments</li> <li>Commitment to corporate strategy, culture and objectives</li> <li>Sensitivity and tactfulness in interpersonal interactions, cross-cultural sensitivity</li> <li>Ability to work in a team</li> <li>Being familiar with the general business culture of the branch/ industry</li> <li>Being aware of the importance of details and precision (accurateness)</li> </ul>	<ul style="list-style-type: none"> <li>Knowing how to make use of search engines on the Internet</li> <li>User skills for successful handling of multimedia software, applications, hardware, etc.</li> <li>Creation of graphic documents, layouts and web design</li> <li>Knowing how to optimize a site according to the requirement of search engines</li> <li>Testing / validating an application, a software and submit a report</li> </ul>	<ul style="list-style-type: none"> <li>Drafting of texts, clearness, concision, orthography, grammar in the native language</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... native country)</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... foreign)</li> <li>Drafting of texts, clearness, concision, orthography, grammar in English</li> <li>Basics of law (in the field of activity, authoring rights, intellectual property rights...)</li> </ul>
<b>Miscellaneous</b>	<p>Netsurfer</p> <p>Newsgroup moderator</p>	<ul style="list-style-type: none"> <li>Information gathering, structuring, analysis and qualification</li> <li>Copy writing</li> <li>Testing and validation of the application</li> <li>Content management and updating</li> <li>Documentation information checking and validation</li> <li>Content writing</li> <li>Content Uploading</li> <li>Participation in newsgroups</li> </ul>	<ul style="list-style-type: none"> <li>Conduct feasibility studies (technical, financial...)</li> <li>Schedule working processes and prioritise tasks independently (time management)</li> <li>Writing requirements specifications, technical specifications and reports/ratio (clearly, precisely and detailed)</li> <li>Develop/ find solutions and validate their relevance and their consequences</li> </ul>	<ul style="list-style-type: none"> <li>Communication in English or other foreign languages</li> <li>Creativity and imagination</li> <li>Analytical thinking and ability to develop synthesis/ ability to analyse and solve problems</li> <li>Being aware of the importance of details and precision (accurateness)</li> <li>Communicating with customers or within the company</li> <li>Commitment to corporate</li> </ul>	<ul style="list-style-type: none"> <li>User skills for successful handling of multimedia software, applications, hardware, etc.</li> <li>Testing / validating an application, a software and submit a report</li> <li>Knowing how to optimize a site according to the requirement of search engines</li> <li>Maintaining / updating an application, a site, a software, computer, a network ...</li> <li>Knowing how to make use of</li> </ul>	<ul style="list-style-type: none"> <li>Drafting of texts, clearness, concision, orthography, grammar in the native language</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... native country)</li> <li>Knowledge of the communication rules on the Internet (writing, visual, sounds... foreign)</li> <li>Drafting of texts, clearness, concision, orthography, grammar in English</li> </ul>

		<ul style="list-style-type: none"> <li>• Newsgroup and website moderation</li> </ul>	<ul style="list-style-type: none"> <li>• Manage, negotiate, direct, control subcontractors</li> <li>• Manage, negotiate, direct, control a team</li> </ul>	<ul style="list-style-type: none"> <li>• strategy, culture and objectives</li> <li>• Ability to work in a team</li> </ul>	<ul style="list-style-type: none"> <li>• search engines on the Internet</li> </ul>	<ul style="list-style-type: none"> <li>• Basics of law (in the field of activity, authoring rights, intellectual property rights...)</li> </ul>
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## Appendix 2 Skillset's amended iMedia Functional Map (2004)

Phases	Functions	Competencies required
<b>Create interactive product</b>	Design	<ul style="list-style-type: none"> <li>• Assist with the technical design process (SKS DMI 1)</li> <li>• Record, store and supply design information* (SKS DMI 2)</li> <li>• Contribute to the production of designs using IT (SKS DMI 3)</li> <li>• Assess the technical implications of the design brief (SKS DMI 4)</li> <li>• Liaise with decision makers regarding the adaptation of existing design solutions (SKS DMI 6)</li> <li>• Architect Interactive Media Products (IM17)</li> <li>• Design Electronic Games (IM20)</li> <li>• Design User Interfaces For Interactive Media Products (IM5)</li> <li>• Plan Content For Web And Multimedia Products (IM16)</li> <li>• Create Narrative Scripts For Interactive Media Products (IM23)</li> <li>• Write And Edit Copy For Interactive Media Products (IM15)</li> </ul>
	Create, prepare and manage assets for interactive product	<ul style="list-style-type: none"> <li>• Create 2D Animations For Interactive Media Products (IM24 )</li> <li>• Create Wire-Frame Models For 3D Animation (IM25 )</li> <li>• Texture Models For 3D Animation (IM26)</li> <li>• Create Sound Effects For Interactive Media Products (IM27)</li> <li>• Create Music For Interactive Media Products (IM28)</li> <li>• Obtain Assets For Use In Interactive Media Products (IM2 )</li> <li>• Prepare Assets For Use In Interactive Media Products (IM3 )</li> <li>• Manage Intellectual Property Rights (IM11)</li> </ul>
	Develop and test interactive product	<ul style="list-style-type: none"> <li>• Determine The Implementation Of Designs For Interactive Media Products (IM8)</li> <li>• Prepare User Interface Assets For Interactive Media Products (IM4)</li> <li>• Use Authoring Tools To Create Interactive Media Products (IM6)</li> <li>• Code Scripts To Provide Functionality For Interactive Media Products (IM7)</li> <li>• Use Mark-Up In Interactive Media Products (IM18)</li> <li>• Use Style-Sheets In Interactive Media Products (IM19)</li> <li>• Program Electronic Games To Develop Functionality (IM21)</li> <li>• Devise User Testing Of Interactive Media Products (IM12)</li> <li>• Conduct User Testing Of Interactive Media Products (IM13)</li> <li>• Evaluate User Testing Of Interactive Media Products (IM14)</li> <li>• Test Electronic Games (IM22)</li> </ul>
<b>Produce interactive product</b>	Manage project	<ul style="list-style-type: none"> <li>• Initiate Interactive Media Projects (IM10)</li> <li>• Provide Creative And Strategic Direction For Interactive Media Projects (IM9)</li> </ul>
	Plan and manage the production of interactive products	<ul style="list-style-type: none"> <li>• Identify the resources required for the production</li> <li>• Identify the risks associated with the production</li> <li>• Prepare budget plans for the production</li> <li>• Plan and schedule the production for interactive products</li> <li>• Co-ordinate project activities</li> <li>• Monitor the progress of the production</li> <li>• Control production expenditure</li> </ul>

		<ul style="list-style-type: none"> <li>• Monitor risks and review contingency plans and action</li> </ul>
	Develop software for interactive products	<ul style="list-style-type: none"> <li>• Data analysis and data structure design (ESK p15 )</li> <li>• Software development - component creation (ESK p68 )</li> <li>• Software development – design (ESK p73 )</li> <li>• Managing software development (ESK p42)</li> <li>• Manage software quality Quality management of ICT products and services (ESK p52)</li> <li>• Technical fault diagnosis (ESK p100 )</li> <li>• Technical fault remedy selection (ESK p106)</li> <li>• Testing ICT systems (ESK p109 )</li> </ul>
<b>Cultivate commercial interface</b>	<p>Develop the organisation's market position</p> <p>Market interactive products</p> <p>Sell interactive products to customers</p> <p>Engage and support customers</p>	<ul style="list-style-type: none"> <li>• Develop and review a framework for marketing (MSC F4 )</li> <li>• Build your organisation's understanding of its market and customers (MSC F9)</li> <li>• Marketing published products (PSG 28 – 33 )</li> <li>• Manage and market yourself as a freelancer (SKS F1)</li> <li>• Develop and implement sales plans</li> <li>• Exploit opportunities to meet and exceed sales targets</li> <li>• Monitor the achievement of sales objectives</li> <li>• Engage and support customers Resolve customer service problems (MSC F5)</li> <li>• Monitor and solve customer service problems (MSC F6)</li> <li>• Support customer service improvements (MSC F7)</li> <li>• Work with others to improve customer service (MSC F8)</li> <li>• Develop a customer focussed organisation (MSC F10)</li> <li>• Manage the achievement of customer satisfaction (MSC F11)</li> </ul>
<b>Manage the organisation</b>	Manage Operations	<p>Develop Organisational Strategy</p> <ul style="list-style-type: none"> <li>• Develop a strategic business plan for your organisation (MSC B3)</li> <li>• Map the environment in which your organisation operates (MSC B2)</li> <li>• Put the strategic business plan into action (MSC B4)</li> </ul> <p>Manage Finance</p> <ul style="list-style-type: none"> <li>• Obtain additional finance for the organisation (MSC E3)</li> <li>• Manage finance for your area of responsibility (MSC E2)</li> </ul> <p>Manage Change</p> <ul style="list-style-type: none"> <li>• Lead change (MSC C4)</li> <li>• Plan change (MSC C5)</li> <li>• Implement change (MSC C6)</li> </ul> <p>Manage Health and Safety</p> <ul style="list-style-type: none"> <li>• Ensure health and safety requirements are met in your area of responsibility (MSC E6)</li> <li>• Ensure an effective organisational approach to health and safety (MSC E7)</li> <li>• Conduct an assessment of risks in the workplace (SKS X3)</li> </ul> <p>Manage Diversity</p> <ul style="list-style-type: none"> <li>• Promote equality of opportunity and diversity in your area of responsibility (MSC B11)</li> </ul>



		<ul style="list-style-type: none"> <li>Promote equality of opportunity and diversity in your organisation (MSC B12)</li> </ul> <p>Manage performance</p> <ul style="list-style-type: none"> <li>Ensure compliance with legal, regulatory, ethical and social requirements (MSC B8)</li> <li>Manage business processes (MSC F3)</li> <li>Improve organisational performance (MSC F12)</li> <li>Develop and implement operational plans for your area of responsibility (MSC B1)</li> </ul>
	Manage people	<p>Manage self</p> <ul style="list-style-type: none"> <li>Manage your own resources (MSC A1)</li> <li>Work Effectively In Interactive Media (IM1)</li> <li>Make effective use of IT</li> </ul> <p>Maintain the organisation's workforce</p> <ul style="list-style-type: none"> <li>Recruit, select and keep colleagues (MSC D3)</li> <li>Plan the workforce (MSC D4)</li> </ul> <p>Maintain the performance of the organisation's people</p> <ul style="list-style-type: none"> <li>Train and develop people at work</li> <li>Build effective teams to achieve objectives</li> </ul> <p>Create effective working relationships</p> <ul style="list-style-type: none"> <li>Contribute to good working relations (SKS X1)</li> <li>Develop effective working relationships with colleagues (MSC D1)</li> <li>Develop your personal networks (MSC A3)</li> </ul> <p>Develop organisational leadership</p> <ul style="list-style-type: none"> <li>Provide leadership for your team (MSC B5)</li> <li>Provide leadership in your area of responsibility (MSC B6)</li> <li>Provide leadership for your organisation (MSC B7)</li> <li>Develop the culture of your organisation (MSC B7)</li> </ul> <p>Encourage innovation</p> <ul style="list-style-type: none"> <li>Encourage innovation in your team (MSC C1)</li> <li>Encourage innovation in your area of responsibility (MSC C2)</li> <li>Encourage innovation in your organisation (MSC C3)</li> </ul>

## Appendix 3 Results of internal review of IGAD competencies

### 1. Previous IGAD production pipeline & professional competency matrix

Role ► Phase ▼	Game Design	Programming Engineering	Visual Art	Production/ Quality assurance	Audio
Concept phase	G1. Game concept G2. Documentation G3. Game design		A1. Graphic Communication		
Design phase			A2. Pipeline design A3. Production design		G4. Audio design
Pre-production phase	G5. Narrative design			G6. Project management	
Production phase		P1. AI programming P2. Tools programming P3. Game engine programming P4. Development with constraints P5. 3D engine programming P6. Audio programming P7. Platform specific programming P8. Game play programming	A4. World Building A5. Advanced modelling A6. Texturing A7. Animation A8. Lighting and rendering		
Post-production phase				G7. Quality assurance G8. Knowledge updating	

### 2. Production Pipeline feedback notes

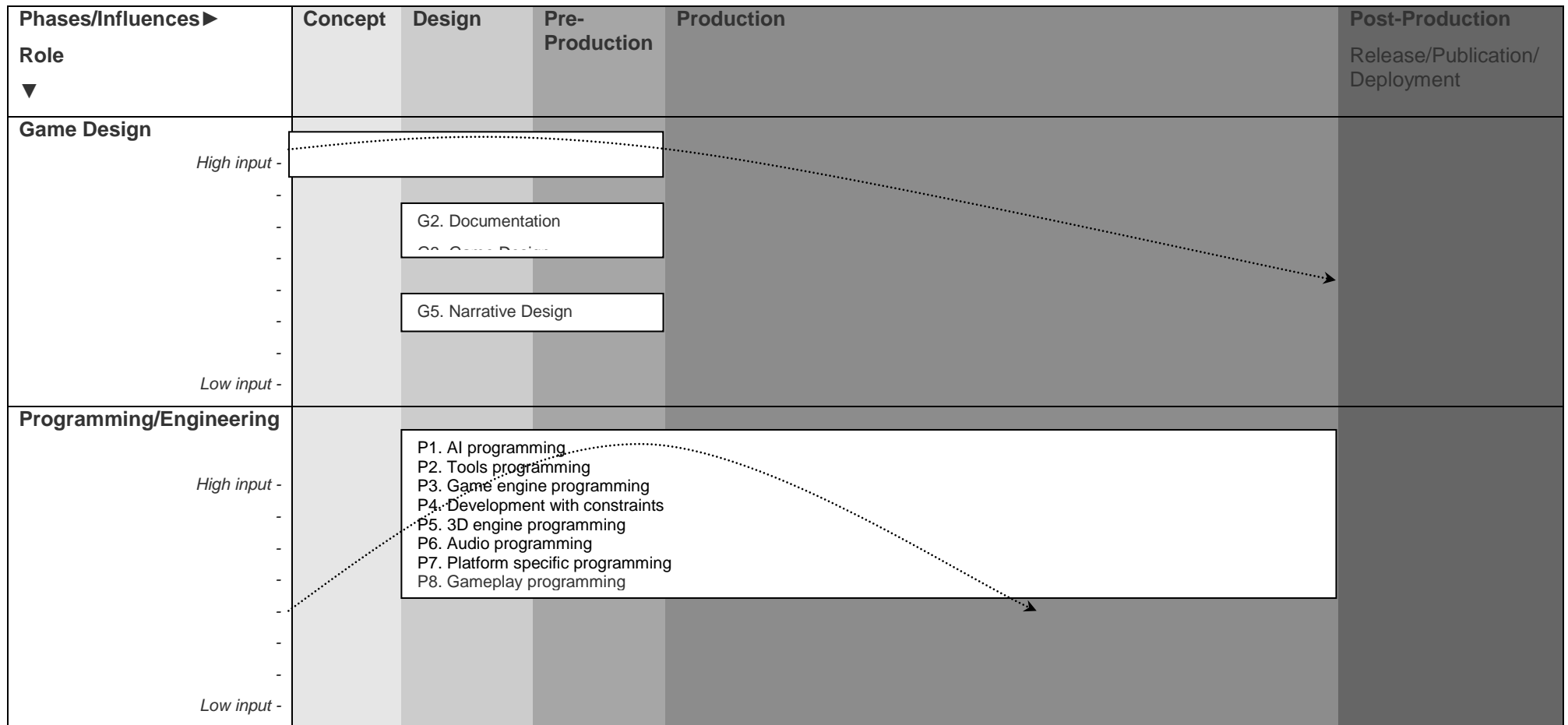
Teacher	Comments	What is missing?
Jacco	<ul style="list-style-type: none"> <li>Above pipeline is applicable if the time frame is 2-3 years for a product and there are 20-100 members in a team, there is careful planning from the outset and there is funding available</li> <li>Reality is that the turnaround time is more likely to be 1 year with about 10 members and doesn't always get through to implementation of the design</li> <li>In the production phase the focus is on interpreting the design document to completion of the product</li> </ul>	Research Skills & Problem solving skills

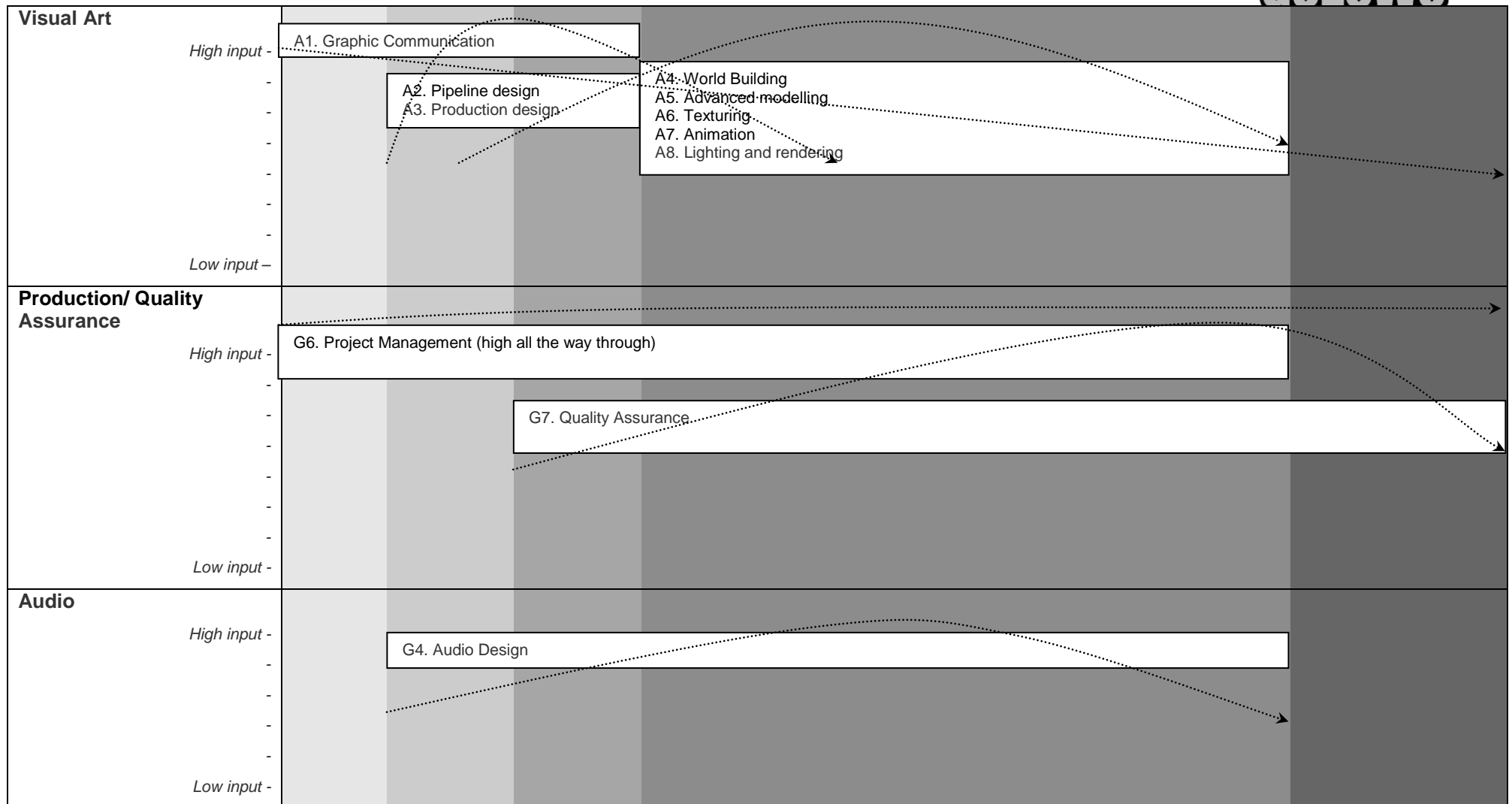
	<ul style="list-style-type: none"> <li>• Need to consider the whole</li> <li>• Good leadership makes the difference</li> <li>• Pre-production phase is not clear</li> <li>• Post production is relevant as that is when a separate QA team does the formal testing at the end, this is only applicable in large companies where the QA team is not related to production team. Don't necessarily have to know anything about programming but it is advantageous eg Electronic Arts employs a group of young people to test the games</li> <li>• Smaller companies test throughout the production pipeline.</li> </ul>	
<b>Brian</b>	<ul style="list-style-type: none"> <li>• In reality there is not preproduction phase but should be left in as an educative tool</li> <li>• Very few publishers pay for a prototype, only want finished product</li> <li>• Original IP-very high risk</li> <li>• Concept has to be good, how it runs is governed by market forces, starts one year before release, lot of pressure</li> <li>• Usually focus on existing IP, less risk</li> <li>• Optimal outcome is if every phase is funded</li> <li>• Crucial factor is Project management of project. Project Manager has to ensure that every milestone is reached</li> <li>• Students need to learn how to work with PM</li> <li>• Programmers need to be involved with the design process</li> <li>• QA should be implemented from Production with a most intense phase in post production.</li> <li>• Audio design and audio programming continuous</li> </ul>	<ul style="list-style-type: none"> <li>• Impact of market forces needs to be considered</li> <li>• Project management should be project participation as misleading term used in competency profile</li> <li>• <b>Factors impacting on configuration of production pipeline:</b> <ul style="list-style-type: none"> <li>○ Size of company</li> <li>○ When first set up-influences type of organisational model</li> <li>○ CEO's vision</li> <li>○ Time line</li> <li>○ Market demand</li> <li>○ Original IP or not</li> <li>○ Number of unknowns</li> <li>○ Funding</li> <li>○ Testing strategy</li> <li>○ Structures/Architecture</li> <li>○ Type of platforms i.e. console and PC are converging</li> <li>○ Effectiveness of project management</li> </ul> </li> </ul>
<b>Dino</b>	<ul style="list-style-type: none"> <li>• Pipeline in reality is not so clear-cut: not just about design but also about building the structure for the product and having a testing strategy for production</li> <li>• Different companies have different strategies</li> <li>• The fewer unknowns, the more linear the process, the lower the economic risk</li> <li>• Original IP –less linear more iterative and riskier</li> <li>• Shorter the timeframe-more linear, less time for iteration (see amended pipeline below)</li> </ul>	<ul style="list-style-type: none"> <li>• Depiction of the iterative development and the influences (rather than phases)</li> <li>• Replace post production with deployment-release/publication</li> <li>• Console development has reached a plateau in its growth (lot of game companies are going bankrupt) and now rapid growth is occurring in the area online games</li> </ul>

		<ul style="list-style-type: none"> <li>• PS4- Playstation 4 ???</li> <li>• Most likely-convergence of console with PC,</li> <li>• More capabilities of multitasking on PC rather than console devices, new generation are multitasking</li> <li>• Most gaming activities will be integrated with other on-line activities-consoles will become more like PCs</li> </ul>
<b>Oliver</b>	<ul style="list-style-type: none"> <li>• Preproduction &amp; Design interchangeable-sectioned off by reviews if green-lighted</li> <li>• Depends on companies to how the production pipeline is orchestrated</li> <li>• 1990s, production pipeline based on film model</li> <li>• 1980s-simple 3 phase model design development and testing i.e. RAVE</li> <li>• Postproduction-testing for bugs</li> <li>• Depends on: who is running it and time of inception</li> <li>• Is it fun-user group first used and now more professional</li> <li>• Grey area</li> <li>• Lack of consistencies in industry as relatively young</li> <li>• Acceleration of growth from being backroom industry to corporation</li> <li>• Variety of interactions</li> <li>• Not established vocabulary and terminology-evident in Academic research-no common language</li> <li>• Not clear cut in design</li> </ul>	
<b>Andrew</b>	<ul style="list-style-type: none"> <li>• If working with a developer can be more flexible</li> <li>• If want to go for the highest quality-let go of the milestone model</li> </ul>	G1-G7 not relevant to visual artists as don't really engage in these competencies, need awareness of these but don't need depth that IGAD covers

## 2.1.1

### 2.1.2 3. Amended IGAD production pipeline & professional competency profile (for each cycle to release)- Expanded version





2.1.3

2.1.4

2.1.5 4. Amended IGAD production pipeline & professional competency profile- short version

Role ► Phases/ Influences ▼	Game Design		Programming Engineering	Visual Art	Production/ Quality Assurance		Audio
Concept phase	G1. Game concept			A1. Graphic Communication	G6. Project Management		G4. Audio design
Design phase		G2. Documentation G3. Game design G5. Narrative design	P1. AI programming P2. Tools programming P3. Game engine programming P4. Development with constraints P5. 3D engine programming P6. Audio programming P7. Platform specific programming P8. Game play programming	A2. Pipeline design A3. Production design			
Pre-production phase						G7. Quality assurance	
Production phase					A4. World Building A5. Advanced modelling A6. Texturing A7. Animation A8. Lighting and rendering		
Post-production phase							
Deployment/ Support							

## 5. Comments and feedback for general IGAD competencies

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>G1. Game-concept development</b>	<ul style="list-style-type: none"> <li>- Game studies (especially the 'ludological' approach)</li> <li>- Knowledge of Interaction design and game aesthetics</li> <li>- Knowledge of videogame genres and videogame history</li> <li>- Knowledge of target groups</li> <li>- Knowledge of the technological possibilities of the various platforms</li> </ul>	<ul style="list-style-type: none"> <li>- Capable of thinking about games design in terms of game studies</li> <li>- Capable of developing new ideas or to innovate or reconfigure elements of existing products</li> <li>- Capable of translating ideas into workable game concepts</li> <li>- Creative</li> <li>- Team player</li> <li>- Prepared to compromise</li> <li>- Open minded</li> <li>- Prepared to offer and receive constructive criticism</li> </ul>	<p>2.1.5.1.1.1 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- Ideas are developed based on the knowledge of the target group, game studies, game history and the specific platform;</li> <li>- Ideas are usually developed in a team.</li> </ul> <p>2.1.5.1.1.2 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The ultimate concept is attractive for the target group.</li> <li>- The concept is technologically attainable within the chosen platform.</li> <li>- The concept takes into account ethical, cultural and social issues.</li> </ul>
<b>Stefano</b>	Nil	See changes above	2.1.5.1.1.3 See changes above



Competency	Knowledge	Skills & Attitude	Performance indicators
<b>G2. Documentation</b>	<ul style="list-style-type: none"> <li>- Of the structure and objectives of game concept documents</li> <li>- Of the structure and objectives of game design documents</li> <li>- Of videogame genres and videogame history</li> <li>- Knowledge of constraints the specific platform imposes</li> </ul>	<ul style="list-style-type: none"> <li>- Good oral and written communication skills</li> <li>- Capability of structuring a technical and self-contained piece of (hyper)text</li> <li>- Systematic</li> <li>- Creative</li> <li>- Team player</li> <li>- Prepared to compromise</li> <li>- Precise and meticulous</li> <li>- Organised</li> <li>- Ability to use and produce visual aides to complement text</li> </ul>	<p>2.1.5.1.1.4 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- Ideas are developed based on knowledge of the target group, game studies and game history.</li> <li>- Ideas are developed in a team.</li> <li>- Game designers ensure that documentation is comprehensive and complete i.e. includes table of contents, main body and, specific appendices etc.</li> </ul> <p>2.1.5.1.1.5 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The game concept document is clear and immediately convincing for the developer/publisher.</li> <li>- The game concept document is sufficiently detailed and comprehensive enough to enable third parties to implement the next phase of the production process.</li> <li>- The game design document needs to be self standing, complete, well organised in order to develop specific sections of the game.</li> </ul>
<b>Stefano</b>	See changes above	See changes above	2.1.5.1.1.6 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>G3. Game Design</b>	<ul style="list-style-type: none"> <li>- Knowledge of the use of game design documents,</li> <li>- Knowledge of cultural, cognitive and emotional aspects of game play,</li> <li>- Familiarity with game studies and their practical applications</li> <li>- Knowledge of game design: game mechanics, iteration, integration</li> <li>- Knowledge of interaction design,</li> <li>- Knowledge of media studies</li> <li>- Basic knowledge of programming, visual design and audio</li> <li>- Knowledge of videogame history</li> </ul>	<ul style="list-style-type: none"> <li>- Communication skills: capable of acting on the instructions of the game designer, art director and lead programmer</li> <li>- Skills in programming or graphic design (see competency descriptions of visual artist or programmer)</li> <li>- Cultural awareness with regards to the specific medium</li> <li>- Creative</li> <li>- Self-critical</li> <li>- Team player</li> <li>- Prepared to critically develop on the game concept</li> <li>- Prepared to compromise</li> <li>- Prepared to offer constructive criticism</li> <li>- Precise and meticulous</li> <li>- Organised</li> </ul>	<p>2.1.5.1.1.7 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- Ideas are developed based on knowledge of the target group, game studies, game history, and technological possibilities and limitations.</li> <li>- Ideas are developed in a team.</li> </ul> <p>2.1.5.1.1.8 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- Design solutions are balanced and complete.</li> <li>- Solutions are integrated and meet the client's expectations and take into account technological limitations.</li> <li>- Game-play elements are optimised to meet specific objectives such as client requests, technical limitations, and target audience profiles.</li> </ul>
<b>Stefano</b>	Nil	Nil	2.1.5.1.1.9 See changes above
<b>Oliver</b>	Nil	Nil	2.1.5.1.1.10 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>G4. Audio Design</b>	Basic principles of audio design: influence on mood and suspense, technological skills, interactive audio, sound effects, 3D audio.	<ul style="list-style-type: none"> <li>- Team player</li> <li>- Flexible</li> <li>- Prepared to compromise</li> <li>- Good communication skills</li> <li>- Result-oriented</li> <li>- Creative and problem-solving skills</li> <li>-</li> </ul>	2.1.5.1.1.11 Criteria regarding the process - Audio designer communicates with the audio engineer and the programmer. <b>2.1.5.1.1.12</b> 2.1.5.1.1.13 Criteria regarding the product - Audio is integrated in the game concept.
<b>Nils</b>	Nil	See changes above	2.1.5.1.1.14 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>G5. Narrative Design</b>	<ul style="list-style-type: none"> <li>- Understanding of classic narrative structures</li> <li>- Knowledge of plotting and writing techniques</li> <li>- Understanding of interactive narrative structures</li> <li>- Scriptwriting</li> </ul>	<ul style="list-style-type: none"> <li>- Capable of producing a high quality narrative</li> <li>- Able to apply classic narrative structures to interactive structures</li> <li>- Ability to integrate narrative content with game play.</li> <li>- Attention to detail</li> <li>- Good communication skills</li> <li>- Creative and problem-solving skills</li> <li>-</li> </ul>	<p>2.1.5.1.1.15 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- Programmer and visual artist create narrative content within the required timeframe.</li> </ul> <p>2.1.5.1.1.16</p> <p>2.1.5.1.1.17 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- Narrative is fully integrated into the design documentation.</li> </ul>
<b>Stefano</b>	Nil	Nil	2.1.5.1.1.18 Nil
<b>Oliver</b>	Nil	Nil	2.1.5.1.1.19 Nil

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>G6. Project Management (participation in project work)</b>	<ul style="list-style-type: none"> <li>- Knowledge of the role of a Producer/Project Manager</li> <li>- Understanding of Project Management methodologies</li> <li>- Knowledge of Pipeline</li> <li>- Understanding of required documentation</li> <li>- Understanding of people-management skills</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Ability to analyse and breakdown game design into its components</li> <li>- Ability to implement the instructions of the game designer, lead programmer and art director</li> <li>- Capacity to develop a project schedule and/or use a schedule as a guideline for one's own tasks</li> <li>- Capacity to analyse and balance the different forces acting on the game development project</li> <li>- Capacity to read planning software output</li> <li>- Ability to analyse and refine working practices</li> <li>- Good communication skills</li> <li>- Problem-solving skills</li> <li>- Organisation skills i.e. tracking and maintaining schedule</li> <li>- Leadership skills</li> <li>- Ability to take direction</li> <li>- Ability to see the big picture</li> </ul>	<p>2.1.5.1.1.20 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The programmer and visual artist manage their tasks under direction to meet the requirements of the project.</li> </ul> <p>2.1.5.1.1.21 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The schedule is achievable.</li> </ul>
<b>Brian</b>	See changes above	See changes above	2.1.5.1.1.22 See changes above
<b>Dino</b>	See changes above	See changes above	2.1.5.1.1.23 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>G7. Quality Assurance</b>	<ul style="list-style-type: none"> <li>- Knowledge of the target group</li> <li>- Knowledge of what makes a well-balanced game</li> <li>- Knowledge of test procedures</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Capable of recognizing, tracking, organising and managing bugs</li> <li>- Capable of implementing improvements based on test feedback</li> <li>- Precise and meticulous</li> <li>- Good communication skills</li> <li>- Organisation skills</li> </ul>	<p>2.1.5.1.1.24 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The game developer designs and implements a test procedure.</li> <li>- Based on feedback produced by the test procedure, the game developer tracks and rectifies errors and implements improvements.</li> <li>- The game developer accurately documents his/her activities and tasks</li> <li>- The game developer reports and manages bugs.</li> </ul> <p>2.1.5.1.1.25 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- A systematic and effective bug-tracking database.</li> <li>- An efficient, optimized and playable game.</li> </ul>
<b>Jacco</b>	2.1.5.1.1.26 Testing occurs in an ongoing fashion		
<b>Brian</b>	2.1.5.1.1.27 Iterative		
<b>Dino</b>	Iterative	See changes above	

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>G8. Knowledge Updating</b>	<ul style="list-style-type: none"> <li>- Knowledge of where to source relevant and appropriate information to keep up to date of trends in the games industry</li> <li>- Knowledge of research methodologies</li> </ul>	<ul style="list-style-type: none"> <li>- Capable of directing one's own learning process</li> <li>- Independent and proactive</li> <li>- Research skills</li> </ul>	<p>2.1.5.1.1.28 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The game developer proactively updates his/her knowledge.</li> </ul> <p>2.1.5.1.1.29 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- Knowledge and skills of the game developer are always up-to-date.</li> </ul>
<b>Jacco</b>	2.1.5.1.1.30 See changes above: Research skills is implicit, perhaps a future competency?		

## 6. Comments and feedback for programming IGAD competencies

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>P1. AI programming</b>	<ul style="list-style-type: none"> <li>- Knowledge of AI techniques, such as path-finding algorithms, neural networks, and agents</li> <li>- Knowledge of behaviour trees and state machines</li> <li>- Knowledge of crafting the illusion of intelligence through the use of chance and probability</li> <li>- Understanding AI as a tool for entertaining</li> </ul>	<ul style="list-style-type: none"> <li>- Problem solving skills</li> <li>- Analysis of behaviour and data</li> <li>- Tuning of complex systems</li> <li>- Appreciation of design choices that result in greater entertainment value</li> </ul>	<p>2.1.5.1.1.31 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The AI programmer is conversant with the techniques by which intelligent behaviour is simulated and keeps this knowledge up-to-date.</li> </ul> <p>.</p> <p>2.1.5.1.1.32 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The AI subsystem is sufficient and utilises the available sources efficiently.</li> <li>- The AI subsystem meets the requirements articulated in the game design document.</li> </ul>
<b>Dino</b>	See changes above	See changes above	2.1.5.1.1.33 See changes above



Competency	Knowledge	Skills & Attitude	Performance indicators
<b>P2. Tools Programming</b>	The tools programmer has knowledge of user interfaces, data structures, software architecture, and existing tools and libraries.	<ul style="list-style-type: none"> <li>- Eye for detail</li> <li>- Software architectural design skills</li> <li>- Analysis and organisation of data</li> </ul>	<p>2.1.5.1.1.34 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The tools programmer identifies the requirements of his/her 'clients' (the other team members) and converts these into useful products.</li> </ul> <p>2.1.5.1.1.35 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The tools are useful to the project and accelerate the production process.</li> <li>- The tools are reusable.</li> </ul>
<b>Jacco</b>	Not taught overtly	Only one Dutch company who uses these skills is NXS-service company for developing tools-port consoles	2.1.5.1.1.36
<b>Dino</b>	See changes above	See changes above	2.1.5.1.1.37 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>P3. Game Engine</b>	The game engine programmer understands the technological aspects of the subsystems and the data flows within the game. The game engine programmer has knowledge of data and spatial structures and optimisation techniques, as well as software engineering.	<ul style="list-style-type: none"> <li>- Software architectural design skills</li> <li>- Analysis and organisation of data</li> <li>- Designing of interfaces that can be used effectively by team members</li> <li>- Profiling of performance and resource use</li> </ul>	<p>2.1.5.1.1.38 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The game engine programmer architecture creates a solid platform upon which to build the rest of the project</li> <li>-</li> </ul> <p>2.1.5.1.1.39 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The game engine can be used across several platform interfaces.</li> <li>- The game engine enables easy expansion or modification of the game.</li> <li>- The game engine is reusable.</li> <li>- The game engine is efficient.</li> </ul>
<b>Dino</b>	See changes above	See changes above	2.1.5.1.1.40 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>P4. Development with resource constraints</b>	<p>The game developer understands the constraints that are commonly encountered in video game development.</p> <p>The game developer knows the techniques that can be used to manage these constraints.</p>	<ul style="list-style-type: none"> <li>- Capable of localising problems regarding resource use and making improvements</li> <li>- Capable of modifying data structures for the purpose of more efficient resource use</li> <li>- Problem solving and developing creative solutions</li> <li>-</li> </ul>	<p>2.1.5.1.1.41 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The game developer analyses the use of resources during the production process and applies optimisations when appropriate...</li> </ul> <p>2.1.5.1.1.42</p> <p>2.1.5.1.1.43 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The game makes efficient use of the system resources for optimal presentation on platforms.</li> </ul>
<b>Jacco</b>	<p>Implicit competency to console development particularly in 3<sup>rd</sup> year</p> <p>2.1.5.1.1.44 NDS-constraints high</p>		
<b>Dino</b>	<p>Has constraints as don't have unlimited disk space or memory</p> <p>See changes above</p>	See changes above	2.1.5.1.1.45 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>P5. 3D Engine Programming</b>	<ul style="list-style-type: none"> <li>- The 3D engine specialist has detailed knowledge of modern 3D technology: Graphic processors, 3D algorithms and 3D structures.</li> <li>- The 3D engine specialist has detailed knowledge of ways to simulate real world phenomena as closely as possible</li> </ul>	<ul style="list-style-type: none"> <li>- The 3D engine specialist is able to choose the best combination from data structures and algorithms available for a specific situation.</li> <li>- The 3D engine specialist is able to work together with the platform specialist.</li> <li>- Analytical</li> <li>- Perfectionist</li> <li>- Team Player</li> <li>- Meticulous and precise</li> <li>-</li> </ul>	<p>2.1.5.1.1.46 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The 3D specialist analyses the requirements stated in the game design document.</li> <li>- The 3D specialist implements an engine that is flexible, efficient and stable and uses the hardware optimally.</li> <li>- The 3D specialist keeps his/her knowledge up to date by playing the newest games and researching the latest techniques.</li> </ul> <p>2.1.5.1.1.47 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The 3D engine enables the game programmer and the artist to implement their ideas with minimal constraints.</li> <li>- The 3D engine uses the hardware optimally.</li> <li>- The 3D engine is easily integrated into the game engine.</li> </ul>
<b>Nils</b>	See changes above	See changes above	2.1.5.1.1.48 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>P6. Audio Programming</b>	<p>The audio engine specialist has detailed knowledge of modern audio technology such as: 3D sound, music interacting with the game play, streaming audio and audio compression.</p> <p>The audio specialist is able to combine his knowledge with that of the 3D engine programmer, in order to create audio that fits within the virtual world.</p>	<p>The audio specialist is able to implement an audio engine for a game, with flexible and efficient functionality for sound effects, music and environmental sounds.</p> <ul style="list-style-type: none"> <li>- Analytical</li> <li>- Diplomatic</li> <li>- Creative</li> <li>- Committed</li> </ul>	<p>2.1.5.1.1.49 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The audio specialist analyses the requirements stated in the game design document.</li> <li>- The audio specialist implements the audio subsystem and uses hardware efficiently.</li> <li>- The audio specialist takes into account differences between platforms and aspires to build an audio engine that is as generic as possible.</li> </ul> <p>2.1.5.1.1.50 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The audio engine optimizes the opportunity for game programmers and artists to create a look and feel within the game.</li> <li>- The audio engine uses system sources efficiently.</li> </ul>
<b>Nils</b>	Changes as above	Changes as above	2.1.5.1.1.51 Changes as above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>P7. Platform specific programming</b>	<p>The platform specialist has detailed knowledge about 'his' platform and can translate this knowledge into program code and advises the other members of the team:</p> <ul style="list-style-type: none"> <li>- Processor technology;</li> <li>- System architecture;</li> <li>- Graphic subsystem (hardware)</li> <li>- Audio subsystem (hardware)</li> </ul> <p>The platform specialist has knowledge of the specific constraints of platforms and knows how to update platforms.</p>	<ul style="list-style-type: none"> <li>- The platform specialist is able to improve the game in order to optimise performance on a specific platform</li> <li>- The platform specialist is able to work with other specialists.</li> <li>- The platform specialist provides advice about implementing game elements.</li> <li>- Problem solving skills</li> </ul>	<p>2.1.5.1.1.52 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The platform specialist assists with implementation of the relevant components of the game and provides information about the specifications of the platform to the team.</li> <li>- The platform specialist updates his/her knowledge</li> </ul> <p>Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The game makes full use of the platform's technical specialists</li> </ul> <p>2.1.5.1.1.53</p>
<b>Dino</b>	See changes above	See changes above	2.1.5.1.1.54 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>P8. Game Play Programming</b>	<p>The game programmer knows what makes a game fun.</p> <p>The game programmer has general knowledge on AI, physics and game engines.</p> <p>The game programmer knows about algorithms and techniques for simulating complex behaviours.</p> <p>The game programmer understands physics simulations.</p>	<ul style="list-style-type: none"> <li>- A critical eye for the analysis of behaviours</li> <li>- Skills in statistical analysis</li> <li>- Behavioural programming skills</li> <li>- Tuning of simulation parameters</li> </ul>	<p>2.1.5.1.1.55 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The game play programmer works in his/her team to implement the game design document.</li> </ul> <p>-</p> <p>2.1.5.1.1.56 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- The game demonstrates entertaining interaction.</li> </ul>
<b>Jacco</b>	<p>Stepping stone into industry or task done by a low skilled programmer</p> <p>Provide extras/dressing to give product appeal</p> <p>2.1.5.1.1.57 Not hard core competency</p>		
<b>Dino</b>	See changes above	See changes above	2.1.5.1.1.58 See changes above

## 7. Comments and feedback for visual art IGAD competencies

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>A1. Graphic communication</b>	<ul style="list-style-type: none"> <li>- 2D software packages</li> <li>- Knowledge of anatomy,</li> <li>- Art history</li> <li>- 3D tools needed to execute the design</li> <li>- Knowledge of composition</li> <li>- Knowledge of perspective</li> </ul>	<ul style="list-style-type: none"> <li>- Observation skills</li> <li>- Tool handling skills</li> <li>- Digital painting skills</li> <li>- Visual organisation skills</li> <li>- Ability to take abstract game play requirements and convert to practical computer generated assets</li> </ul>	2.1.5.1.1.59 Criteria regarding the product <ul style="list-style-type: none"> <li>- Artwork clearly communicates graphic information.</li> </ul>
<b>Andrew</b>	See changes above	See changes above	2.1.5.1.1.60 See changes above



Competency	Knowledge	Skills & Attitude	Performance indicators
<b>A2. Pipeline design</b>	<ul style="list-style-type: none"> <li>- The background of computer graphics</li> <li>- The subject matter</li> <li>- 3D software packages</li> <li>- 2D software packages</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>- Observation skills</li> <li>- Analytical skills</li> <li>- Research skills</li> <li>- Ability to visualise on paper and by means of software packages.</li> <li>-</li> </ul>	2.1.5.1.1.61 Pipeline is efficient and accomplishes production goals
<b>Andrew</b>	See changes above	See changes above	2.1.5.1.1.62 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>A3. Production Design</b>	<ul style="list-style-type: none"> <li>- Working methods of modelers, textures and animators</li> <li>- Art history</li> <li>- History of architecture and industrial design</li> <li>- Anatomy</li> <li>- 2D/3D Computer Graphics</li> <li>- Drawing skills</li> </ul>	<ul style="list-style-type: none"> <li>- Observation skills</li> <li>- Skills in computer aided design</li> <li>- Accurate/meticulous</li> <li>- Team player</li> <li>- Problem solving skills</li> <li>- Result-oriented</li> <li>- Organisational skills: using knowledge for project related goal.</li> </ul>	<ul style="list-style-type: none"> <li>- Production design materials are clearly understood by staff and practical.</li> </ul>
<b>Andrew</b>	See changes above	See changes above	2.1.5.1.1.63 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>A4. World Building</b>	<ul style="list-style-type: none"> <li>- Sound knowledge of 3D software packages</li> <li>- General knowledge of scripting</li> <li>- Knowledge of the use of production design documents</li> <li>- Knowledge of game mechanisms and interface design (GUI).</li> </ul>	<ul style="list-style-type: none"> <li>- Communication skills</li> <li>- Capable of working with production design documents</li> <li>- Designing, 3D modelling, applying textures, applying effects and lighting for a game environment</li> <li>- Creative</li> <li>- Proactive (making innovative and original contributions to the game concept)</li> <li>- Quickly assimilates new technologies</li> <li>- Team player</li> </ul>	<p>2.1.5.1.1.64 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- Good communication with game designer, art director and fellow-artists.</li> <li>- The visual artist is capable of carrying out his tasks before set deadlines in a result- and solution-oriented manner.</li> </ul> <p><b>2.1.5.1.1.65</b></p> <p>2.1.5.1.1.66 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- Good likeness and efficiently built</li> </ul>
<b>Andrew</b>	See changes above	See changes above	2.1.5.1.1.67 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>A5. Advanced Modelling</b>	<ul style="list-style-type: none"> <li>- Polygonal modelling</li> <li>- NURBS modelling</li> </ul>	<ul style="list-style-type: none"> <li>- 3D designer can work within milestones</li> <li>- Strong observation skills</li> <li>- Accurate</li> <li>- Meticulous</li> <li>- Result-oriented</li> <li>- Organisational skills</li> <li>- Error checking skills</li> </ul>	<p>2.1.5.1.1.68 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- Capable of conducting technical research when it is appropriate</li> </ul> <p>2.1.5.1.1.69</p> <p>2.1.5.1.1.70 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- Level of finish</li> <li>- Meets highest aesthetic standards</li> <li>- 3D objects follow guidelines of the production design document</li> <li>- Efficient use of computer graphic elements</li> </ul>
<b>Andrew</b>	See changes above	See changes above	2.1.5.1.1.71 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>A6. Texturing</b>	<ul style="list-style-type: none"> <li>- 3D colour theory</li> <li>- Sound knowledge of 2D and 3D computer graphics applications</li> <li>- Up to date texturing techniques</li> <li>- UV lay-out and editing</li> <li>- Art History</li> <li>- Materials</li> </ul>	<ul style="list-style-type: none"> <li>- Observation skills</li> <li>- Drawing skills</li> <li>- Painting skills</li> <li>- Finding and using reference material</li> <li>- To separate observed phenomena into its constituent texturable layers</li> <li>- Accurate / meticulous</li> <li>- Team player</li> <li>- Problem solving skills</li> <li>-</li> </ul>	2.1.5.1.1.72 Criteria regarding the product Maps meet technical and aesthetic standards of project
<b>Andrew</b>	See changes above	See changes above	2.1.5.1.1.73 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>A7. Animation</b>	<ul style="list-style-type: none"> <li>- Knowledge of animal locomotion</li> <li>- Knowledge of animation techniques</li> <li>- General knowledge of scripting (f.i. MEL)</li> <li>- Knowledge of anatomy</li> <li>- Knowledge of rigging</li> <li>- Knowledge of animation</li> </ul>	<ul style="list-style-type: none"> <li>- Observation skills: observation of how things move</li> <li>- Feeling for timing, weight and movement</li> <li>- Feeling for story structure, theatre, movement and dynamics.</li> <li>- Feeling for human expression and theatrical techniques</li> <li>- Communication skills</li> <li>- Capable of working with storyboards</li> <li>- Skills to implement the animation techniques mentioned under “knowledge”.</li> <li>- Team player</li> <li>- Creative</li> <li>- Independent and proactive work attitude</li> </ul>	<p>2.1.5.1.1.74 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- Understands animation limitations of engine</li> </ul> <p><b>2.1.5.1.1.75</b></p> <p>2.1.5.1.1.76 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- Animations are clear, natural, efficient and adhere to pipeline requirements.</li> </ul>
<b>Andrew</b>	See changes above	See changes above	2.1.5.1.1.77 See changes above

Competency	Knowledge	Skills & Attitude	Performance indicators
<b>A8. Lighting and rendering</b>	<ul style="list-style-type: none"> <li>- Real world lights</li> <li>- CG lighting</li> <li>- Lighting pipelines</li> <li>- Difference between real-time and pre-rendered lighting</li> <li>- Color</li> <li>- Structural lighting</li> <li>- Cinematic lighting techniques</li> <li>- Knowledge of intrinsic colour theory</li> </ul>	<ul style="list-style-type: none"> <li>- Ability to interpret physical lighting or design lighting to suit needs of a project</li> <li>- Team player</li> <li>- Creative</li> <li>- Independent and proactive work attitude</li> <li>- Colour mixing</li> <li>- Colour selection</li> <li>- Colour harmony</li> </ul>	<p>2.1.5.1.1.78 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>- The artist is capable of independently identifying and solving problems Good communication with the rest of the team.</li> </ul> <p>2.1.5.1.1.79 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>- Lighting is natural, meets aesthetic standards and adheres to pipeline requirements.</li> </ul> <p>2.1.5.1.1.80</p>
<b>Andrew</b>	See changes above	See changes above	2.1.5.1.1.81 See changes above

## Appendix 4 Questionnaire for IGAD program

### Competency Profile Questionnaire: International Game Architecture Design



(IGAD) program.

**Objectives:** To determine the importance and frequency of use of the Dutch and Belgium games industry.

competencies of the IGAD program in

To identify and qualify other competencies that may be required currently and in the future for the industry.



### **3 1. Background information**



ORGANISATION	INTERACTIVE MEDIA ROLES								
<b>1.1 Contact Name:</b> .....  <b>1.2 Role:</b> .....  <b>1.3 Organisation:</b> .....  <b>1.4 Location:</b> .....  <b>1.5 Telephone number:</b> .....  <b>1.6 Email address:</b> .....  <b>1.7 Size:</b> <div style="margin-left: 20px;"> <input type="checkbox"/> 1-10  <input type="checkbox"/> 11-25  <input type="checkbox"/> 25-100  <input type="checkbox"/> &gt;100         </div> <b>1.8 Core Business:</b> ..... ..... ..... ..... ..... .....	<b>1.10 Number of employees working in creating and producing web-focussed entertainment products and services in your company</b>  <div style="margin-left: 40px;"> <input type="checkbox"/> 1-5  <input type="checkbox"/> 6-25  <input type="checkbox"/> 26-100  <input type="checkbox"/> &gt;100         </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left; padding: 5px;">1.11 Titles of these roles</th> <th style="width: 50%; text-align: left; padding: 5px;">1.12 Qualifications of role <i>(indicate by x)</i></th> </tr> </thead> <tbody> <tr> <td style="height: 100px;"></td> <td style="padding: 5px; vertical-align: top;"> <input type="checkbox"/> Diploma-MBO  <input type="checkbox"/> Bachelor-HBO  <input type="checkbox"/> Masters-HBO  <input type="checkbox"/> Bachelor-University  <input type="checkbox"/> None  <input type="checkbox"/> Other.....            .....         </td> </tr> <tr> <td style="height: 100px;"></td> <td style="padding: 5px; vertical-align: top;"> <input type="checkbox"/> Diploma-MBO  <input type="checkbox"/> Bachelor-HBO  <input type="checkbox"/> Masters-HBO  <input type="checkbox"/> Bachelor-University  <input type="checkbox"/> None  <input type="checkbox"/> Other.....            .....         </td> </tr> <tr> <td style="height: 100px;"></td> <td style="padding: 5px; vertical-align: top;"> <input type="checkbox"/> Diploma-MBO  <input type="checkbox"/> Bachelor-HBO  <input type="checkbox"/> Masters-HBO  <input type="checkbox"/> Bachelor-University  <input type="checkbox"/> None  <input type="checkbox"/> Other.....            .....         </td> </tr> </tbody> </table>	1.11 Titles of these roles	1.12 Qualifications of role <i>(indicate by x)</i>		<input type="checkbox"/> Diploma-MBO <input type="checkbox"/> Bachelor-HBO <input type="checkbox"/> Masters-HBO <input type="checkbox"/> Bachelor-University <input type="checkbox"/> None <input type="checkbox"/> Other..... .....		<input type="checkbox"/> Diploma-MBO <input type="checkbox"/> Bachelor-HBO <input type="checkbox"/> Masters-HBO <input type="checkbox"/> Bachelor-University <input type="checkbox"/> None <input type="checkbox"/> Other..... .....		<input type="checkbox"/> Diploma-MBO <input type="checkbox"/> Bachelor-HBO <input type="checkbox"/> Masters-HBO <input type="checkbox"/> Bachelor-University <input type="checkbox"/> None <input type="checkbox"/> Other..... .....
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<p>.....</p> <p><b>1.9.. Clients (examples):</b></p> <p>.....</p> <p>.....</p> <p>.....</p>		<p><input type="checkbox"/> Diploma-MBO</p> <p><input type="checkbox"/> Bachelor-HBO</p> <p><input type="checkbox"/> Masters-HBO</p> <p><input type="checkbox"/> Bachelor-University</p> <p><input type="checkbox"/> None</p> <p><input type="checkbox"/> Other.....</p>

**GoLeWe**

## 4 2. Current Production Pipeline for IGAD program

Role ► Phase/ Influences ▼	Game Design		Programming Engineering	Visual Art	Production/ Quality Assurance		Audio
Concept phase	G1. Game concept			A1. Graphic Communication	G6. Project Management		
Design phase		G2. Documentation G3. Game design G5. Narrative design	P1. AI programming P2. Tools programming P3. Game engine programming P4. Development with constraints	A2. Pipeline design A3. Production design			G4. Audio design
Pre-production phase			P5. 3D engine programming P6. Audio programming P7. Platform specific programming P8. Game play programming	A4. World Building A5. Advanced modelling A6. Texturing A7. Animation A8. Lighting and rendering		G7. Quality assurance	
Production phase							
Post- production phase							
Release/Public ation/Deploym ent/Support							

### 2.1 Comments & Feedback

Topics	Placement in pipeline	Other comments
Phases/Influences		

<b>Game Design competences</b>		
<b>Programming competencies</b>		

<b>Visual Art competencies</b>		
<b>Production/Quality Assurance</b>		

Audio		



#### **4. IGAD program competencies**

4.1 What competencies do you consider currently important in the interactive media industry?

4.2 What competencies will be required in the interactive media industry in the future

## 4.3 Ratings of IGAD program competencies

**Frequency ratings:**

- 0- never
- 1- sometimes
- 2- often
- 3- always

Game Design	Importance Yes/no	Frequency (0-3)	Comments
G1. Game concept			
G2. Documentation			
G3. Game design			
G4. Audio design			
G5. Narrative design			
G6. Project management			
G7. Quality assurance			
G8. Knowledge updating			
<b>Programming competencies</b>			
P1. AI programming			
P2. Tools programming			

P3. Game engine programming			
P4. Development with constraints			
P5. 3D engine programming			
P6. Audio programming			
P7. Platform specific programming			
P8. Game play programming			
<b>Art Competencies</b>			
A1. Graphic Communication			
A2. Pipeline design			
A3. Production design			
A4. World Building			
A5. Advanced modelling			
A6. Texturing			
A7. Animation			
A8. Lighting and rendering			

## 5 Glossary-

## 6 IGAD program competencies

Game Design
<p><b>G1. Game concept</b>  <i>In this phase, the game concept is developed by means of a study of source material and offering constructive criticism during the brainstorming sessions. This is done by experienced staff members, such as the game designer, art director and lead programmer. The starting game developer, however, can also make his contribute to this process resorting to her/his creativity, sensitivity and knowledge of existing games.</i></p>
<p><b>G2. Documentation</b>  <i>The game concept and game design has to be documented in a manner that is comprehensible to third parties and easily accessible by developers. Documentation is commonly a team effort supervised, structured and iterated by an experienced industry professional like the game designer or the senior game designer. The starting game developer, however, can also make his contribution in the study of source material, implementing specific sections of the documentation or offering constructive criticism during the brainstorming sessions.</i></p>
<p><b>3. Game design</b>  <i>In this phase, the game concept is developed by studying source material and offering constructive criticism during the brainstorming sessions. This is done by experienced staff members, such as the game designer, art director and lead programmer. The starting game developer, however, can also make his contribute to this process resorting to her/his creativity, sensitivity and knowledge of existing games.</i></p>
<p><b>G4. Audio design</b>  <i>Sound is an essential component of the game experience. That is why an audio design has to be made in the concept phase. Although the study programme does not focus on matters such as composing music, the visual artist and the programmer will have to learn to master the technological side of audio at basic level.</i></p>
<p><b>G5. Narrative design</b>  <i>An understanding of the use of narrative within interactive media is increasingly essential within the production and design of videogames. Game narrative needs to be developed in tandem with the full design documentation and fully integrated with game play.</i></p>
<p><b>G6. Project management</b>  <i>After the basic design documentation has been drafted, it is translated by the producer into a schedule. Based on this schedule, the programmer and visual artist have to carry out their tasks before set deadlines in a result-oriented manner. Project management concern itself with the definition, management and delivery of tasks.</i></p>

## G7. Quality assurance

*Both during prototyping and developing, testing and blind-testing are crucial elements of the iteration process. After the completion of the production phase, the game has to be polished before release through more iteration cycles. The programmer and the visual artist have to be capable of recognizing, reporting and fixing mistakes, errors and imperfections. Part of the skills to be built involves organizing and scheduling the testing cycles.*

## G8. Knowledge updating

*The game industry is characterised by constant changes in terms of both technology and market, for this reason a game developer not only needs to harness knowledge and skills, but to keep them up-to-date as well, in a proactive manner. To this end, it is important to be aware of research methodologies.*

*History of videogames, game studies and media-studies participate in the general context of this competency together with more specifically technology and production oriented topics.*

## Programming competencies

### P1. AI programming

*The opponents in a computer game display intelligent behaviour, which is simulated by artificial intelligence. Other entities (such as computer-controlled fellow-players) also have to behave true-to-life. The AI specialist is capable of programming this behaviour.*

### P2. Tools programming

*To develop a game, you need several tools. Sometimes you can use existing products, such as packages for 3D modelling or for composing music for the game. In other cases, specific tools are necessary, which are designed especially for a game, or existing tools need to be modified. The tools programmer is capable of converting technological specifications into a user-friendly and efficient product, which both the technological and the non-technological team members are able to work with.*

### P3. Game engine programming

*The game engine is the 'glue' between the various game components, and coordinates the communication between these components. The game engine integrates several subsystems, such as the 3D engine and the audio subsystem, deals with user input, and ensures that graphic elements are loaded from disc in time. A good game engine is generic, flexible, stable, reusable and can be used in several platforms. The game engine constitutes a safe foundation for the other team members to build on.*

### P4. Development with constraints

*A game uses its memory capacity efficiently, so that less data have to be read from disc, as a result of which the game runs smoother. The game developer is capable of analysing and optimising the memory use of his program.*

<p><b>P5. 3D engine programming</b>  <i>The 3D specialist knows the newest technologies and is able to have the graphic processor draw a virtual world quickly and with a high sense of realism. He is able to translate the specific requirements of the game into a good, design that is adjusted to the game.</i></p>
<p><b>P6. Audio programming</b>  <i>The audio specialist builds the subsystem that produces the audio for the game. Modern games have high requirements regarding audio: Sounds within the virtual world come from different sides, and special effects like echo and reverb are used. Music is streamed directly from the disk. Most of the time only a fraction of the processor time is available for audio. Therefore the audio specialist uses system sources efficiently.</i></p>
<p><b>P7. Platform specific programming</b>  <i>Modern games are released on several platforms, like PC and one or more consoles. The platform specialist knows everything about 'his' platform and advises the other members of the team who implement parts of the game, or implements platform specific parts of subsystems.</i></p>
<p><b>P8. Game play programming</b>  <i>The game programmer converts the game design document into a game. The game engine is his basis, the 3D engine and the other systems his tools. The game programmer makes optimal use of these components, makes suggestions for improvements of these components and knows how to get maximum results.</i></p>
<p><b>Art Competencies</b></p>
<p><b>A1. Graphic Communication</b>  <i>A visual artist's greatest strength is the ability to communicate complex ideas graphically. This is of particular importance when designing the first stages of a game, which often requires visualisation of abstract concepts.</i></p>
<p><b>A2. Pipeline design</b>  <i>Solving art requirements based on initial target criteria.</i></p>
<p><b>A3. Production design</b>  <i>In order to design the final look of the game, the production designer must, primarily using 2D tools, communicate to every member of the team how whatever element of the game should look like.</i></p>
<p><b>A4. World Building</b>  <i>After the internal game design document has been drafted, the various levels have to be actually built. This is mostly done in large teams which work parallel on the components of a level.</i></p>
<p><b>A5. Advanced modelling</b>  <i>Apart from the game environment, characters and objects, often with complex curved surfaces have to be created, based on the production design.</i></p>

document.

## A6. Texturing

*Without a correct application of textures even a perfect model comes across as unrealistic.*

## A7. Animation

*Without animation nothing moves. Movement is necessary for interaction. Animation solves this problem.*

## A8. Lighting and rendering

*To be visible, all CG assets need to have lighting. Good lighting will enhance the aesthetic value of the final product, whether it is rendered real-time or pre-rendered.*

Appendix 5 Questionnaire for A&T program

**Competency Profile Questionnaire:**

**Art & Technology for the Next Generation  
Program Variation (A&T)**



**Entertainment**

**Objective:** To determine the importance and frequency of use of competencies taught by the NHTV, Academy of Digital Entertainment, IGAD programs and in particular, the A&T program variation in the Dutch and Belgium interactive media industry. To identify and qualify other competencies that may be currently required for the industry or in the future.



**7 1. Background information**



ORGANISATION	INTERACTIVE MEDIA ROLES								
<p>1. Name:.....</p> <p>2. Role: :.....</p> <p>3. Organisation: :.....</p> <p>4. Location:.....</p> <p>5. Telephone number:</p> <p>6. Email address:</p> <p>7. Size:</p> <div style="margin-left: 40px;"> <input type="checkbox"/> 1-10  <input type="checkbox"/> 11-25  <input type="checkbox"/> 25-100  <input type="checkbox"/> &gt;100         </div> <p>8. Core Business:.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>10. Number of employees working in creating and producing web-focussed entertainment products and services in your company</p> <div style="margin-left: 40px;"> <input type="checkbox"/> 1-5  <input type="checkbox"/> 6-25  <input type="checkbox"/> 26-100  <input type="checkbox"/> &gt;100         </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 50%; text-align: left; padding: 5px;">11. Titles of these roles</th> <th style="width: 50%; text-align: left; padding: 5px;">12. Qualifications of role <i>(indicate by x)</i></th> </tr> </thead> <tbody> <tr> <td style="height: 100px;"></td> <td> <input type="checkbox"/> Diploma-MBO  <input type="checkbox"/> Bachelor-HBO  <input type="checkbox"/> Masters-HBO  <input type="checkbox"/> Bachelor-University  <input type="checkbox"/> None  <input type="checkbox"/> Other.....               </td> </tr> <tr> <td style="height: 100px;"></td> <td> <input type="checkbox"/> Diploma-MBO  <input type="checkbox"/> Bachelor-HBO  <input type="checkbox"/> Masters-HBO  <input type="checkbox"/> Bachelor-University  <input type="checkbox"/> None  <input type="checkbox"/> Other.....               </td> </tr> <tr> <td style="height: 100px;"></td> <td> <input type="checkbox"/> Diploma-MBO  <input type="checkbox"/> Bachelor-HBO  <input type="checkbox"/> Masters-HBO  <input type="checkbox"/> Bachelor-University  <input type="checkbox"/> None  <input type="checkbox"/> Other.....               </td> </tr> </tbody> </table>	11. Titles of these roles	12. Qualifications of role <i>(indicate by x)</i>		<input type="checkbox"/> Diploma-MBO <input type="checkbox"/> Bachelor-HBO <input type="checkbox"/> Masters-HBO <input type="checkbox"/> Bachelor-University <input type="checkbox"/> None <input type="checkbox"/> Other.....		<input type="checkbox"/> Diploma-MBO <input type="checkbox"/> Bachelor-HBO <input type="checkbox"/> Masters-HBO <input type="checkbox"/> Bachelor-University <input type="checkbox"/> None <input type="checkbox"/> Other.....		<input type="checkbox"/> Diploma-MBO <input type="checkbox"/> Bachelor-HBO <input type="checkbox"/> Masters-HBO <input type="checkbox"/> Bachelor-University <input type="checkbox"/> None <input type="checkbox"/> Other.....
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<b>9. Clients (examples):</b>  ..... ..... ..... ..... ..... ..... .....		

## 8 2. Proposed production pipeline

Please comment on the following proposed Production Pipeline in the A& T program.

<p>CREATION OF INTERACTIVE MEDIA PRODUCT/SERVICE</p> <p>(of prototype)</p>	<ul style="list-style-type: none"> <li>• Design</li> <li>• Create &amp; manage</li> <li>• Develop (to prototype)</li> <li>• Test</li> </ul>
<p>PRODUCTION OF INTERACTIVE MEDIA PRODUCT/SERVICE</p> <p>(of finished product/service)</p>	<ul style="list-style-type: none"> <li>• Plan</li> <li>• Manage resources &amp; risk</li> <li>• Budget</li> <li>• Schedule</li> <li>• Develop (to release)</li> <li>• Test</li> </ul>

Source: [Interactive Media & Computer Games Functional Map](http://www.skillset.org/standards/standards/IM/), Skillset, the Sector Skills Council for Creative Industries-UK  
<http://www.skillset.org/standards/standards/IM/>

## 9 3. A&T program competencies

3.1. What competencies are currently important in the interactive media industry?

3.2 What competencies will be required in this industry in the future?

### 3.3 Ratings of A&T program core competencies

**Frequency ratings:** 0- never

1- sometimes

2- often

3- continuously

**IMP/S**-Interactive media product/service

Core Competencies	Importance Yes/no	Frequency (0-3)	Comments
C1. Liaise with decision makers regarding the adaptation of existing design solutions			
C2. Design the Architecture of Interactive media product/service (IMP/S)			

C3. Design, obtain and prepare user interfaces for IMP/S			
C4. Record, store and supply design documentation			
C5. Plan, write and edit content for IMP/S			
C6. Project Management for creation of IMP/S to prototype <ul style="list-style-type: none"> <li>• Manage Intellectual Property Rights to release/publication</li> <li>• Manage resources and assess risks required for the production</li> <li>• Prepare budget plans for the production</li> <li>• Plan and schedule the production for IMP/S (work flow practices)</li> <li>• Track and manage IMP/S progress</li> </ul>			
C7. Quality Assurance of IMP/S to prototype <ul style="list-style-type: none"> <li>• Devise, conduct and evaluate testing of IMP/S to prototype</li> <li>• Devise, conduct and evaluate testing of IMP/S to release/publication</li> </ul>			
C8. Managing self & others <ul style="list-style-type: none"> <li>• Work effectively in Interactive Media</li> <li>• Create effective working relationships</li> <li>• Master appropriate interpersonal, oral and written communication (English)</li> <li>• Cross cultural communication skills</li> <li>• Develop leadership</li> </ul>			

• Knowledge updating			
C9. Commercial skills • Manage and market as freelancer			

## 10      3.4      Ratings of A&T program, Technology & Art competencies

Frequency ratings:    0- never

1- sometimes

2- often

3- continuously

**IMP/S**-Interactive media product/service

Technology Competencies	Importance Yes/no	Frequency (0-3)	Comments
T1. Contribute to functional design process <ul style="list-style-type: none"> <li>Inventorise functionality</li> </ul>			
T2. Assess the technical implications of the design brief			
T3. Implement functionality of IMP/S to prototype <ul style="list-style-type: none"> <li>Consideration of the type of technology used in terms of costs and functionality for IMP/S</li> <li>Consideration of authoring tools to create IMP/S</li> <li>Code scripts and mark ups to prototype</li> <li>Program web based electronic games to develop functionality</li> </ul>			



T4. Implement functionality to release/publication <ul style="list-style-type: none"> <li>Data analysis and data structure design</li> </ul>			
Art Competencies	Importance Yes/no	Frequency (0-3)	Comments
A1. Contribute to the visual design of the product/service			
A2. Create Art Resources to prototype <ul style="list-style-type: none"> <li>Prepare user interface assets for IMP/S</li> <li>Use style-sheets in IMP/S</li> <li>Create 2D animations for IMP/S</li> <li>Create 3D animation</li> </ul>			
A3. Produce Art Resources to release/publication <ul style="list-style-type: none"> <li>Produce 2D animations for IMP/S</li> <li>Produce 3D animation</li> <li>Produce music sound effects for IMP/S</li> <li>Create &amp; produce video effects for MP/S</li> </ul>			

## Appendix 6 Art & Technology Program Competencies

These are largely based on the UK's *National Occupational Standards for Interactive Media and Computer Games* (Skillset 2005) and also have some references to the *NAME Project-Nomenclature Analysis of European Multimedia* (Bahry 2002). Below is a glossary to assist with terminologies used in the competencies (Skillset, 2005).

### Glossary

#### **Appropriate people**

*Depending on the work environment, appropriate people from whom to seek feedback might include the client; manager, the editor; peer colleagues; proofreaders; subject matter experts; or representatives of the target audience. There could be others; the point is to seek feedback from people who are entitled, or who are in a position, to contribute to the effectiveness of work produced.*

#### **Project sponsors**

*These could include the project's client, internal or external decision makers, internal account handlers or third-party stakeholders, such as investors or publishers.*

#### **Product**

*This term is used to define the outcome of an interactive media development project. In some sub-sectors or areas of activity, other terms, such as 'solution' or 'deliverable' may be more appropriate.*

#### **Product information**

*Information about the product, such as its intended purpose and target audiences, or factors relevant to the context in which the product is developed, such as the project sponsor's brand identity, organisational aims and objectives, internal processes, stakeholders etc. Such information may be provided in a brief or other documentation such as corporate literature, or may need to be identified through a discovery process.*

#### **Design parameters**

*Factors that will influence or constrain the design of the product, such as the expectations and requirements of the target audience, the capabilities of the technologies being used, the nature of the product's content, and any business strategy underpinning its development*

## Core Competencies

Competency	<b>C1. Provide creative and strategic direction for interactive media projects</b>
Description	<p>Ability to understand and specify the product's commercial requirements and/or purpose.</p> <p>These roles require expertise in business, management, content, design and technical disciplines and have a close relationship with project management. However this function focuses on the project's creative requirements rather than the mechanics of running it. In reality, the two functions are often combined.</p>
Examples of job titles	Producer, Project Director
Criteria regarding product and process (also referred to as indicators)	<p>Criteria in regards to process</p> <ul style="list-style-type: none"> <li>• Collaborate with the project sponsors to: <ul style="list-style-type: none"> <li>- Identify existing design solutions which meets the parameters of the brief and select possible adaptations which will contribute to design ideas for further consideration;</li> <li>- Evaluate potential design adaptations against significant parameters of the design brief;</li> <li>- Discard options which fail to meet design parameters and identify alternatives which offer significant advantages over discarded options;</li> <li>- If it is not possible to produce one solution that meets all requirements of the brief, assess realistic changes to the design brief and make recommendations;</li> <li>- Assess realistically the implication of modifying the design brief and record the outcomes;</li> </ul> </li> <li>• Combine creative, logical and analytical thinking;</li> <li>• Contribute to project teams and specialists;</li> <li>• Ensure the project's business objectives and creative vision are clearly defined and met.</li> </ul> <p>Criteria in regards to product</p> <ul style="list-style-type: none"> <li>• Originate conceptual ideas, usually in consultation with others;</li> <li>• Produce written or drawn design documentation to produce a fit for purpose product or service in line with initial specifications required by the decision makers and the targeted market.</li> </ul>

Knowledge	<ul style="list-style-type: none"> <li>• Understanding of market developments, new technologies, techniques and best practice;</li> <li>• Understanding of the different technologies, tools, formats, and creative or technical approaches that are available and their advantages, disadvantages and implications;</li> <li>• Understanding the nature, constraints, opportunities and parameters of the platforms technologies and media;</li> <li>• Understanding of common problems, design changes and contingencies that may occur in a project and how to manage their impact;</li> <li>• Knowledge of different sources of existing design options;</li> <li>• Knowledge of different types of evaluation for testing existing design solutions;</li> <li>• Understanding the needs and expectations of the organisation's design and production staff;</li> <li>• Understanding of the different specialist skills that may be required for a given project ;</li> <li>• Understanding the nature of the client's business and the context in which the product is required;</li> <li>• Understanding of the inter-relations between content, design and technology;</li> <li>• Understanding the importance of sound project management processes, including the need to obtain approval for one key stage before proceeding to the next.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to identify and select which technologies, tools, and creative or technical approaches would be most appropriate to use;</li> <li>• Ability to use text and diagrams or drawings to create clear and accurate specification documents from which the product can be designed;</li> <li>• Ability to explain technical or specialist issues or work to non-technical people or to specialists in other areas;</li> <li>• Ability to seek and respond constructively to advice or feed back from decision makers concerning the quality, fitness for purpose, or any other aspect of the project;</li> <li>• Ability to conduct discussions and negotiations in a way that promotes co-operation and goodwill;</li> <li>• Ability to devise and implement contingency plans for reasonably foreseeable setbacks that might affect the ability to deliver work on time.</li> </ul>

Competency	<b>C2. Create the functional design of interactive media product/service (IMP/S)</b>
Description	<p>The ability to design the overall product concept and functionality, and specify this through appropriate documentation.</p> <p>The ability to interpret high-level requirements to devise an appropriate solution, including, user experience, interface specification and enabling technologies.</p>
Examples of job titles	Technical Lead, Technical Director, User Experience Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Combine creative, logical and analytical thinking;</li> <li>• Use of a range of relevant enabling technologies to demonstrate functionality;</li> <li>• Devise end-user features such as navigational or functional devices;</li> <li>• Prepare design briefs or give instructions to technical developers;</li> <li>• Devise and document game rules (electronic games);</li> <li>• Specify the characteristics of the game world i.e. attributes and behaviours of objects and characters in sufficient detail for realisation by others (electronic games).</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Produce functioning prototypes;</li> <li>• Produce document of technical specifications;</li> <li>• Present a game design that is fun and playable (electronic games).</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding of the different creative and technical approaches that are available;</li> <li>• Knowledge of the relevant technologies and their capabilities;</li> <li>• Understanding the nature of the client's business and the context in which the product is required;</li> <li>• Understanding of the target audience and their expectations and preferences;</li> <li>• Understanding the impact on the product/service design of technical parameters such as the target device's processing power, memory, bandwidth, screen size, resolution, colour depth, input device etc.;</li> <li>• Knowledge of relevant standards, conventions and guidelines;</li> <li>• Understanding of requirements for localisation, and the impact</li> </ul>

	<p>of these on the product architecture.</p> <ul style="list-style-type: none"> <li>• Knowledge of the relevant principles and methodology of software engineering;</li> <li>• Knowledge of theories of game design (electronic games);</li> <li>• Knowledge of different genres of game and the types of audience they appeal to (electronic games)</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to obtain and analyse product information to determine relevant design parameters;</li> <li>• Ability to specify functionality and decide how end-user features should operate;</li> <li>• Ability to develop user personas, usage scenarios and user journeys;</li> <li>• Ability to design content structures, navigational devices and interface functions that are appropriate to the target users and product purpose;</li> <li>• Ability to devise appropriate naming, coding or mapping conventions for documenting the product structure;</li> <li>• Ability to select and specify features that will assist usability, navigation and location of content;</li> <li>• Ability to liaise with colleagues to ensure the product design and user interface are suitable for the product's intended purpose and audience;</li> <li>• Ability to document specifications and designs in appropriate formats and in sufficient detail to serve as a blueprint for the product development i.e. using text, drawings, wire-frames, storyboards, maps or diagrams.</li> </ul>

Competency	<b>C3. Create the visual design of interactive media product/service (IMP/S)</b>
Description	<p>The ability to design the “look and feel” of the user interface for a product and ensure that all the required visual assets are created and available in the right format and prepared for its technical implementation.</p> <p>Some examples of industry-standard software used:</p> <ul style="list-style-type: none"> <li>• <i>Adobe ImageReady</i></li> <li>• <i>Adobe Fireworks</i></li> <li>• <i>Equilibrium DeBabelizer</i></li> <li>• <i>Terran Interactive Media Cleaner</i></li> <li>• <i>Adobe Photoshop</i></li> <li>• <i>Adobe Illustrator</i></li> <li>• <i>Adobe Freehand</i></li> <li>• <i>Flash</i></li> </ul>
Examples of job titles	Web Designer, Interface Designer, Interaction Designer, Production Assistant, Web Developer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Design static and animated visual components;</li> <li>• Specify how elements should respond to user interaction.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• The required component assets are created and available in the right format;</li> <li>• Visuals for user interfaces and/ or environments are produced;</li> <li>• Designs conform to good visual design principles.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding the product’s purpose and target users;</li> <li>• Understanding the expectations and requirements of target users;</li> <li>• Knowledge of the constraints and parameters within the design including target platforms and their capabilities for delivering assets;</li> <li>• Knowledge of relevant standards and conventions relating to user-interface design and industry-standard software tools;</li> <li>• Knowledge of colour theory i.e. the effect of image colour-depth, resolution and dimensions on file-size;</li> <li>• Understanding of usability and accessibility issues relating to graphical or audio interface components;</li> <li>• Knowledge of the principles of typography;</li> <li>• Knowledge of the relevant sources of additional assets, such as sound libraries etc. When rights clearances are needed to use assets;</li> <li>• Knowledge of visual design theory – principles and elements of</li> </ul>

	<p>visual design.</p> <ul style="list-style-type: none"> <li>• Knowledge of good visual communication vocabulary;</li> <li>• Knowledge of the role of storyboards and concept art to communicate visual ideas.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow a design brief or other instructions;</li> <li>• Ability to design within specified parameters and constraints relating to the target platform and medium;</li> <li>• Ability to design end user features to facilitate the use of interactive products;</li> <li>• Ability to select and agree the visual style and interactive character of products;</li> <li>• Ability to design interfaces or environments that are attractive, easy to use and fit for purpose;</li> <li>• Ability to liaise with colleagues to ensure the designs can be implemented within the available resources and project parameters;</li> <li>• Ability to deliver designs in appropriate formats so that they can be easily implemented;</li> <li>• Ability to specify where and when additional assets, such as sounds and animations should be incorporated into the interface;</li> <li>• Ability to provide documentation or instructions as required to ensure that others have the necessary information to implement the design properly;</li> <li>• Ability to use digital image manipulation tools;</li> <li>• Ability to use digital video and audio editing tools;</li> <li>• Ability to achieve appropriate file-sizes and efficient data-transfer rates while maintaining asset quality;</li> <li>• Ability to select or create appropriate colour palettes for graphical interface assets;</li> <li>• Ability to draw on visual design elements principles to create good visual design;</li> <li>• Ability to communicate visual ideas verbally;</li> <li>• Ability to communicate visual ideas with storyboards, thumbnails and concept art.</li> </ul>



Competency	<b>C4. Create the content design of interactive media product/service (IMP/S)</b>
Description	<p>The ability to plan, write and/or edit the content of an interactive media product. This could range from short user instructions to entire web pages.</p> <p>The ability to provide a brief or guidance for copywriters, editors, illustrators, animators etc. in collaboration with the Producer's specifications. At times, there is a requirement to liaise with intellectual property specialists to obtain rights to use material owned by others.</p>
Examples of job titles	Content Strategist, Content Director, Webmaster, Copywriter, Copy Editor
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>Identifying key messages, themes, tone and personality for written content;</li> <li>Specifying visual or other assets</li> <li>Developing house styles and publishing guidelines.</li> <li>Determine the content and style of text-based content;</li> <li>Be responsible for the overall direction and quality of the text-based content.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>Create and develop content in response to a detailed or sketchy brief, or write up an original idea.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>Knowledge of different styles of writing and their suitability for different audiences and communication objectives;</li> <li>A wide knowledge of cultural, historical, popular and literary influences which can be used to enhance and amplify the message;</li> <li>Knowledge of relevant theories and principles of Media, Communication, Cognitive and Narrative theories;</li> <li>Understanding of the characteristics and appeal of different genres of story telling;</li> <li>Knowledge of any relevant conventions, style guides or policies that you need to follow;</li> <li>Understanding of usability issues and relevant accessibility standards and guidelines;</li> <li>Knowledge of any requirements for localisation, and the impact of these on the product content;</li> <li>Understanding of content management systems;</li> <li>Understanding of organisational processes, resource issues, or other factors that may affect the project sponsor's on-going</li> </ul>

	<ul style="list-style-type: none"> <li>ability to create, update and manage content;</li> <li>• Knowledge of the legal and contractual implications of using material in which others hold intellectual property rights;</li> <li>• Knowledge of relevant legislation concerning intellectual property, copyright, libel and obscenity.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to obtain and analyse product information to identify messages and themes for the content;</li> <li>• Ability to devise appropriate writing styles;</li> <li>• Ability to use instructional text to enhance the product's usability, and when it may be needed;</li> <li>• Ability to make creative connections from a wide range of cultural, historical popular and literary influences to enhance the effectiveness of the text;</li> <li>• Ability to check the reliability and currency of any information sources you use;</li> <li>• Ability to write text that takes account of search-engine optimisation techniques while remaining attractive and readable for humans;</li> <li>• Ability to develop and document guidance, styles and policies for writers and other content contributors that are clear, realistic, relevant and easy to access;</li> <li>• Ability to write in a consistent style suitable for the target audience and the purpose of the communication;</li> <li>• Ability to structure the text-based content so that it is easy to read and navigate;</li> <li>• Ability to follow relevant writing conventions, style guides and policies;</li> <li>• Ability to proof-read copy to check for spelling, grammatical, typographic or other errors;</li> <li>• Ability to check that any facts and figures that are quoted are accurate;</li> <li>• Ability to comply with relevant legislation.</li> </ul>

Competency	<b>C5. Project Management for the creation, development and production of interactive media product/service (IMP/S)</b>
Description	<p>The ability to contribute to translating the basic design documentation into a plan and schedule for production. The ability to work effectively with the designated leader to execute the process.</p> <p>Some industry-standard tools used are:</p> <ul style="list-style-type: none"> <li>• <i>MAVEN</i></li> <li>• <i>CMI</i></li> <li>• <i>ACRUP</i></li> <li>• <i>ANT</i></li> <li>• <i>AGILE</i></li> </ul>
Examples of job titles	Project Manager, Studio Manager
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Address multiple demands without losing focus or energy;</li> <li>• Recognise changes in circumstances promptly and adjust plans and activities accordingly;</li> <li>• Find practical ways to overcome barriers;</li> <li>• Keep the team informed of plans and developments;</li> <li>• Present information clearly, concisely, accurately and in ways that promote understanding;</li> <li>• Monitor the quality of work and progress against plans and take appropriate corrective action, where necessary;</li> <li>• Create a sense of common purpose;</li> <li>• Ensure that the team manages their tasks to meet the requirements of the project.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Ensure the schedule is achievable within budget and stipulated time frame.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of agreed key objectives and scope of the project and the available resources;</li> <li>• Understanding of the overall organizational, vision, objectives, plans, policies, practices and activities that may affect the project and any other project currently operating;</li> <li>• Understanding the roles and key responsibilities of all team members;</li> <li>• Knowledge of the principles, processes, tools and techniques for managing projects commonly used in the industry;</li> <li>• Knowledge and oversight of production processes;</li> <li>• Understanding of people-management skills such as teambuilding, motivation, facilitation of problem solving and</li> </ul>

	<p>communication;</p> <ul style="list-style-type: none"> <li>• Understanding of the basic principles, methods and techniques of total quality management including knowledge of the appropriate financial tracking tools;</li> <li>• Understanding risks and contingencies common to the industry/sector;</li> <li>• Knowledge of sector relevant ISO standards legislation, regulations, guidelines, best practices and codes of practice ;</li> <li>• Understanding of required documentation.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to analyse, breakdown and implement the design brief into its components;</li> <li>• Ability to develop a project schedule for team members;</li> <li>• Ability to analyse and balance the different forces acting on the development project;</li> <li>• Ability to analyse and refine working practices;</li> <li>• Ability to manage, motivate, plan, monitor, and assess people through knowledge, ideas and new approaches;</li> <li>• Ability to assess and manage risk;</li> <li>• Ability to manage change within projects;</li> <li>• Ability to monitor the project so that it achieves the stated objectives in the most effective and efficient way, on time and within the budget;</li> <li>• Ability to provide support to allow the project team to perform efficiently and effectively;</li> <li>• Ability to integrate quality processes and use the feedback to implement further improvements.</li> </ul>

Competency	<b>C6. Quality Assurance of interactive media product/service (IMP/S) in all stages of the production pipeline.</b>
Description	<p>The ability to make recommendations about how the product might need to be changed as a result of quality testing as all stages of development need to conform to various International, Industry and in-house standards.</p> <p>Designing, conducting and evaluating user tests are crucial elements of the iterative process and ensure a product or product design is:</p> <ol style="list-style-type: none"> <li>1. Fit for its intended purpose;</li> <li>2. Usable by its intended users;</li> <li>3. Of sufficient quality.</li> </ol>
Examples of job titles	Tester, Quality Assurance Manager
Criteria regarding product and process (also referred to as indicators)	<p>10.1.1.1.1.1 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>• Ensure that all development processes conform to relevant standards;</li> <li>• Design, conduct and evaluate a test procedure;</li> <li>• Select and recruit test observers/facilitators where appropriate, and ensure they are properly briefed about the objectives of the test and its assessment criteria;</li> <li>• Track and rectify errors and implement improvements based on feedback produced by the test procedure;</li> <li>• Document activities and tasks accurately and in an appropriate format;</li> <li>• Recommend design changes arising from the test results to the appropriate party.</li> </ul> <p>10.1.1.1.1.2 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>• A product or service that is compliant with all relevant standards;</li> <li>• A systematic and effective bug-tracking database;</li> <li>• An efficient, optimized and effective IMP/S.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of sector relevant ISO standards, W3C Web standards, legislation, regulations, guidelines, best practices and codes of practice. These will include standards for usability, accessibility and other W3C web standards;</li> <li>• Knowledge of relevant theoretical domains such as Human-Computer Interaction (HCI), Engagement/Immersion, Communication and Media theory etc.;</li> <li>• Knowledge of the needs of the target group;</li> <li>• Knowledge of the product throughout its development cycle;</li> <li>• Understanding of the tracking process and documentation of various aspects of the project throughout the QA test cycle (reports, updates, resources, budgets, etc);</li> </ul>

	<ul style="list-style-type: none"><li>• Knowledge of test strategies procedures and where to source testing resources;</li><li>• Knowledge of suitable qualitative and quantitative procedures and processes to evaluate testing processes.</li></ul>
Skills	<ul style="list-style-type: none"><li>• Ability to accurately interpret relevant standards documentation;</li><li>• Ability to implement relevant international, industry and in-house standards effectively;</li><li>• Ability to select testing methods capable of generating valid data about the overall product design;</li><li>• Ability to plan, organise and schedule the testing cycles;</li><li>• Ability to recognise, track, organise and manage bugs;</li><li>• Ability to analyse qualitative and quantitative data;</li><li>• Ability to liaise diplomatically with relevant colleagues, in particular designers and developers, to negotiate changes to the design or implementation;</li><li>• Ability to evaluate testing process and implement improvements based on test feedback.</li></ul>

<b>Competency</b>	<b>C7. Managing self &amp; others</b>
<b>Description</b>	<p>The ability to manage oneself effectively and develop productive working relationships with internal and external parties.</p> <p>The ability to understand the relevant industry, corporate, technological, and creative domains.</p> <p>The ability to continuously update skills and knowledge in these domains.</p>
<b>Examples of job titles</b>	Not applicable
<b>Criteria regarding product and process (also referred to as indicators)</b>	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Conduct discussions and negotiations in a way that promotes co-operation and goodwill;</li> <li>• Seek and respond constructively to advice or feed back from appropriate people concerning the quality, fitness for purpose, or any other aspect of, your work;</li> <li>• Comply with legal requirements, industry regulations, organisational policies and professional codes;</li> <li>• Contribute to an atmosphere of professionalism and mutual support;</li> <li>• Present information clearly, concisely, accurately and in ways that promote understanding;</li> <li>• Take personal responsibility for making things happen;</li> <li>• Able to take decisions autonomously while acting within the limits of given authority;</li> <li>• Demonstrate integrity, fairness and consistency in decision-making;</li> <li>• Understand people's needs and modelling behaviour that shows respect, helpfulness and co-operation;</li> <li>• Manage continuing professional development;</li> <li>• Maintain up-to-date awareness of industry developments, new technologies, techniques and best practice.</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Understanding principles of effective communication and how to apply them in order to communicate effectively with colleagues and stakeholders.</li> <li>• Understand and take account of the priorities, expectations and authority of colleagues and stakeholders in decisions and actions.</li> <li>• Knowledge of the relevant regulations, standards and codes of practice, behaviour and performance.</li> <li>• Knowledge of different genres of written communication for specific audiences i.e. formatting and styles;</li> <li>• Knowledge of the principles and practices of effective</li> </ul>

	<p>interpersonal communication;</p> <ul style="list-style-type: none"> <li>• Knowledge of the English language</li> <li>• Understanding of cross cultural issues in communication;</li> <li>• Knowledge that different styles of management exist;</li> <li>• Knowledge of difficulties and challenges that may arise, including conflict, diversity and inclusion issues within the team, and ways of identifying and overcoming them;</li> <li>• Knowledge of appropriate resources to update skills and knowledge such as newsgroups, mailing lists, web sites, seminars, courses, networking opportunities etc.;</li> <li>• Knowledge of research methods and techniques.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to identify your organisation's stakeholders including background information and the nature of their interest in your organisation;</li> <li>• Ability to present ideas to colleagues and gain their support;</li> <li>• Ability to establish working relationships with all colleagues;</li> <li>• Ability to recognise, agree and respect the roles and responsibilities of colleagues;</li> <li>• Ability to communicate and listen effectively and take into account individual and cultural differences;</li> <li>• Ability to contribute to encouraging and supporting team members to achieve their personal work objectives and those of the team and provide recognition when objectives have been achieved or when there have been setbacks or change;</li> <li>• Ability to identify and sort out conflicts of interest and disagreements with colleagues in ways that minimise damage to work being carried out;</li> <li>• Ability to give and receive frank and constructive feedback;</li> <li>• Ability to respond constructively to feedback, whether negative or positive;</li> <li>• Ability to encourage and recognise creativity and innovation within the team;</li> <li>• Ability to write for different audiences;</li> <li>• Ability to use written business and technical terminology accurately and effectively using the appropriate format and style in English;</li> <li>• Ability to structure written material appropriately;</li> <li>• Ability to adapt style of interpersonal communication e.g. intonation, inflexion, business or technical terminology and vocabulary, to suit audience needs;</li> <li>• Ability to effectively facilitate personal and professional development.</li> </ul>

<b>Competency</b>	<b>C8. Business and Management</b>
Description	<p>The ability to manage business processes to ensure that organisation delivers outputs that meet customers and stakeholders' needs, and organisational and legal requirements.</p> <p>The ability to ensure that relevant and reliable information about the</p>



	<p>organisation's market and customers is accessible.</p> <p>The ability to develop, implement and evaluate business plans.</p>
Examples of job titles	Account Manager, New Business Developer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Identify and prioritise business objectives;</li> <li>• Develop and agree on business plans and budgets for the achievement of the organisational strategies, setting out clear actions, risks, contingencies, accountabilities and milestones;</li> <li>• Identify and provide the business resources required;</li> <li>• Take account of influences that may affect and shape how business processes work;</li> <li>• Develop business process measures that are affordable and appropriate;</li> <li>• Identify customers' needs, expectations and predicted future demand levels;</li> <li>• Identify and assess current and future developments in your sector, including competitors' activities;</li> <li>• Identify and assess threats to and weaknesses in, the organisation's business plan;</li> <li>• Monitor and report on the implementation and performance of the plan against milestones and budgets.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Effective and sustainable business processes and resources;</li> <li>• Implement effective methods to review and improve business and marketing plans</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of principles, models and measurement tools for effective business management;</li> <li>• Understanding of business decision making for risk and reward against potential investment cost;</li> <li>• Knowledge of the sector trends, market developments and competitor performance that affect business processes.</li> <li>• Knowledge of organisation's aims, goals, structure, values, culture, products, services and processes;</li> <li>• Knowledge of the sources of professional market-research expertise;</li> <li>• Knowledge of methods of gaining customer feedback, and the costs and benefits associated with them.</li> <li>• Knowledge of information software products that assist with collecting and analysing information.</li> <li>• Understanding how to secure competitive advantage;</li> <li>• Knowledge of the legal and regulatory restrictions that may affect the organization's business plans;</li> <li>• Knowledge of Industry/sector and organization's requirements for developing and implementing business plans;</li> <li>• Knowledge of sources of advice, and support from business and marketing specialists.</li> </ul>

Skills	<ul style="list-style-type: none"> <li>• Ability to define business processes and ensure that these are sustainable and effective in their use;</li> <li>• Ability to identify, develop and prioritise business objectives that are consistent with the organisation's overall business plan;</li> <li>• Ability to assess risk and reward against their potential investment cost;</li> <li>• Ability to effectively communicate business plans to relevant stakeholders to ensure understanding and commitment;</li> <li>• Ability to respond positively and creatively to setbacks.</li> <li>• Ability to comply with, legal requirements, industry regulations, organisational policies and professional codes.</li> <li>• Ability to monitor the quality of business performance and progress against plans and take appropriate corrective action, where necessary;</li> <li>• Ability to identify trends and recognise their impact upon current and future business performance;</li> <li>• Ability to obtain advice and support from business and marketing specialists;</li> <li>• Ability to implement, monitor and report on the business plan as agreed and within budget and milestones;</li> <li>• Ability to develop and implement measures and methods for evaluating the implementation of the business plan.</li> </ul>

## Competencies for Digital Technicians

Competency	<b>T1. Contribute to establishing functional and technical processes to implement design of IMP/S</b>
Description	<p>The ability to determine the implementation of designs for IMP/S.</p> <p>The ability to understand functional, design, or other specifications and determine the best way to build the product.</p>
Examples of job titles	Technical Lead, Technical Director
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>Analyse product information, designs and specifications to identify technical requirements and parameters;</li> <li>Evaluate relevant technologies, development or authoring tools, mark-up, scripting or programming languages, and approaches, and decide which are appropriate to use;</li> <li>Determine if and which standards or guidelines must be adhered to;</li> <li>Document research and development activity in the form of technical specifications;</li> <li>Undertake research and develop prototypes as appropriate in order to test ideas, approaches, technologies and tools;</li> <li>Maintain up-to-date knowledge and awareness of current technologies, languages, tools and best practice that are relevant to interactive media product development;</li> <li>Liaise with colleagues to ensure functional specifications are workable;</li> <li>Liaise with the relevant party to obtain approval for functional specifications and decisions.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>Develop prototypes as appropriate to prove ideas, approaches, technologies and tools.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>Knowledge of relevant technical standards and guidelines;</li> <li>Knowledge of different mark-up, scripting and programming languages;</li> <li>Knowledge of authoring tools, development environments and coding tools;</li> <li>Knowledge of relevant and appropriate technologies;</li> <li>Understanding the IMP/S's overall purpose, intended use and requirements, in particular relating to any integration with other systems and any likely future need for maintenance or</li> </ul>

	<ul style="list-style-type: none"> <li>modification;</li> <li>Knowledge of information sources about latest technologies, approaches, best practice and current trends in the use of interactive media technologies and tools;</li> <li>Knowledge of the resources, capabilities and skills within an organisation and/or available to the project;</li> <li>Knowledge of interaction design issues.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>Ability to interpret and follow functional specifications or other briefs;</li> <li>Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>Ability to identify project parameters and constraints including target platforms and their capabilities;</li> <li>Ability to identify and select appropriate approaches, technologies, mark-up, scripting or programming languages, development environments and other tools with which to develop the product;</li> <li>Ability to appropriately use particular technologies, approaches, languages or tools, and the implications of doing so.</li> </ul>

Competency	<b>T2. Implement functionality of interactive media product/service (IMP/S)</b>
Description	<p>The ability to create and deploy the overall product, using an appropriate front-end and back-end development environment (i.e. the authoring tools, scripting language, programming language).</p> <p>Some industry-standard tools used:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Flash</i></li> <li>• <i>Adobe Dreamweaver</i></li> <li>• <i>Adobe GoLive</i></li> <li>• <i>Microsoft FrontPage</i></li> <li>• <i>Microsoft Silverlight</i></li> <li>• <i>ActionScript</i></li> <li>• <i>JavaScript</i></li> <li>• <i>VBScript</i></li> <li>• <i>Python</i></li> <li>• <i>Java</i></li> <li>• <i>Adobe Flex</i></li> <li>• <i>Ajax</i></li> <li>• <i>MySQL</i></li> <li>• <i>Perl</i></li> <li>• <i>C</i></li> <li>• <i>C++</i></li> <li>• <i>C#</i></li> <li>• <i>Air</i></li> <li>• <i>ASP.net</i></li> <li>• <i>Objective-c</i></li> <li>• <i>PHP</i></li> </ul>
Examples of job titles	Web Developer, Web Programmer, Multimedia Programmer, Game Programmer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Assemble, organise and check the required content and assets;</li> <li>• Select and use a development environment to develop functionality according to provided specifications;</li> <li>• Code effectively to provide specified functionality;</li> <li>• Test and debug the product to ensure it operates correctly within specified parameters;</li> <li>• Fix any bugs or problems that come to light from testing;</li> <li>• Liaise with colleagues to ensure functional designs and specifications are correctly implemented;</li> <li>• Respond positively to requests for changes arising from user testing and changes to work schedules and timescales.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Produce code that is readable, re-usable and maintainable;</li> <li>• Clearly document code so that others can understand it;</li> <li>• Deploy the finished product in the appropriate format.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of relevant programming principles and best practice (such as object-oriented and/or procedural programming);</li> <li>• Knowledge of the principles of interaction design and especially issues of usability and accessibility;</li> <li>• Understanding the functions and syntax of the scripting and/or programming language being used;</li> <li>• Knowledge of available development environments, their</li> </ul>

	<p>advantages and disadvantages, and when it is appropriate to use them;</p> <ul style="list-style-type: none"><li>• Knowledge of project parameters and constraints including target platforms and their capabilities;</li><li>• Knowledge of the format in which the product will be deployed (for example, web, CD-Rom, DVD, mobile device, etc.);</li><li>• Knowledge of the sources of information for help, tips and tricks for making most effective use of the development environment being used;</li><li>• Knowledge of the implications of requests for changes to functionality;</li><li>• Understanding the expectations of others who may be involved in debugging, using or modifying the code;</li><li>• Understanding of data structures and how they contribute to the functionality of IMP/S;</li><li>• Knowledge of any limitations of the chosen development environment that may affect the smooth operation and usability of the product being created or capacity to de-bug it easily.</li></ul>
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Skills	<ul style="list-style-type: none"><li>• Ability to interpret and follow functional specifications or other briefs;</li><li>• Ability to clarify requirements or raise issues in response to the functional specification or brief;</li><li>• Ability to write efficient code that is easy to read, debug and maintain;</li><li>• Ability to use chosen development environment;</li><li>• Ability to clearly document code;</li><li>• Ability to test and debug code efficiently;</li><li>• Ability to write custom debugging code and have additional expertise in some of the following areas:<ol style="list-style-type: none"><li>1. Physics programming</li><li>2. Graphics programming</li><li>3. Network programming</li><li>4. Artificial Intelligence programming</li><li>5. Logic/mathematical skills</li></ol></li><li>• The ability to structure data in order to achieve functionality;</li><li>• The ability to meet deadlines in relation to the quality of outputs against the specification.</li></ul>
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## Competencies for Visual Artists

Competency	<b>A1. Produce user interface assets and visual styles for interactive media product/service (IMP/S)</b>
Description	<p>The ability to prepare interface design for technical implementation.</p> <p>The ability to use style-sheets (e.g. CSS, XSL) to create web pages.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Dreamweaver</i></li> <li>• <i>Microsoft FrontPage</i></li> <li>• <i>Adobe ImageReady</i></li> <li>• <i>Adobe Fireworks</i></li> <li>• <i>Equilibrium DeBabelizer</i></li> <li>• <i>Terran Interactive Media Cleaner</i></li> </ul>
Examples of job titles	Computer Graphic Artist, Assistant Producer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Slice a visual design to create component assets (e.g. buttons) in a manner that makes technical implementation as simple as possible;</li> <li>• Follow instructions provided by the interface designer;</li> <li>• Source additional assets, such as sound effects, as appropriate to the designer's instructions;</li> <li>• Select or create appropriate colour palettes for graphical interface assets;</li> <li>• Test and debug your style sheets;</li> <li>• Document style-sheets so they can be understood by others;</li> <li>• Respond positively to requests for changes.</li> <li>• Optimise slicing and preparing interface components to contribute to the smooth and fast operation of the finished user interface;</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Create all the required component assets (e.g. for different button states);</li> <li>• Create style-sheets that comply with relevant standards, guidelines or conventions;</li> <li>• Produce well-formed, robust, accurate and efficient style-sheets.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding of project parameters and constraints including target platforms and their capabilities;</li> </ul>



	<ul style="list-style-type: none"> <li>• Knowledge of industry-standard software tools and development environments;</li> <li>• Knowledge of sources of information for help, tips and tricks, e.g. for making most effective use of CSS;</li> <li>• Understanding how the assets, style sheets will be used in the finished product;</li> <li>• Understanding when rights clearances are needed to obtain and use assets;</li> <li>• Understanding of the file formats that can be supported by the target platform and/or intended authoring tool;</li> <li>• Knowledge of naming conventions, standards, guidelines or specifications;</li> <li>• Knowledge of usability and accessibility issues relating to graphical or audio interface components;</li> <li>• Knowledge of web pages to which style-sheets will be applied;</li> <li>• Knowledge of the implications of later requests for changes to the product;</li> <li>• Understanding the requirements and expectations of those who may be involved in debugging, using or modifying assets and style-sheets;</li> <li>• Knowledge of CSS syntax;</li> <li>• Knowledge of W3C web standards and accessibility guidelines; Understanding the effect of image colour-depth, resolution and dimensions on file-size;</li> <li>• Understanding the effect of audio, video and animation in the context of interface design.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow specifications or other briefs;</li> <li>• Ability to find relevant sources of additional assets, such as style galleries etc.</li> <li>• Ability to liaise with others to ensure you obtain the assets you need at the right time and in appropriate formats;</li> <li>• Ability to use digital image manipulation tools;</li> <li>• Ability to analyse mark-up to determine the page structure and identify the elements you need to provide for in your style-sheets;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to produce style-sheets that are easy to debug and maintain;</li> <li>• Ability to clearly document style-sheets;</li> <li>• Ability to test and debug your style-sheets efficiently, especially for cross-browser compatibility.</li> </ul>

Competency	<b>A2. Produce 2D &amp; 3D animations for interactive media product/service (IMP/S)</b>
Description	<p>The ability to create two and three dimensional objects and environments for animations as part of an interactive media product.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Flash</i></li> <li>• <i>Alias Wavefront</i></li> <li>• <i>Alias Maya</i></li> <li>• <i>Discreet 3D Studio Max</i></li> <li>• <i>Discreet 3D Studio</i></li> <li>• <i>Soft Image XSI</i></li> </ul>
Examples of job titles	Animator, Flash Developer, Interface Designer, Modeller, Artist, Texture Artist
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Design animations within specified style guidelines;</li> <li>• Design animations within specified parameters and constraints relating to the target platform and medium;</li> <li>• Create animations that are attractive, easy to use and fit for purpose;</li> <li>• Liaise with the relevant authority to obtain approval for your animations;</li> <li>• Save animations in appropriate formats so that they can be easily incorporated into the product;</li> <li>• Provide clear documentation as necessary for others to incorporate your animations into the product;</li> <li>• Organise animations using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>• Liaise with colleagues, such as designers and developers, to ensure your animations are appropriate and meet requirements.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Animated interface components (such as buttons);</li> <li>• Animated transitions between interfaces;</li> <li>• Objects that animate or move in response to user interaction (such as expanding menus).</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of the relevant standards and conventions relating to user-interface design;</li> <li>• Knowledge of the principles of traditional and computer animation;</li> <li>• Knowledge of 2D and 3D modelling and animation;</li> <li>• Knowledge of the principles of interaction design, especially regarding usability and accessibility;</li> </ul>

	<ul style="list-style-type: none"> <li>• Understanding the impact of technical parameters such as the target device's processing power, memory, bandwidth, screen size, resolution, colour depth, input device etc.,</li> <li>• Knowledge of the product's purpose and target users;</li> <li>• Knowledge of the expectations and requirements of target users;</li> <li>• Knowledge of the events or user interactions that will trigger your animations;</li> <li>• Understanding of the creative style and overall concept of the product in which texture models will be used;</li> <li>• Understanding of how animation will be used in the product (for example, whether it will play once, loop several times or indefinitely etc.);</li> <li>• Knowledge of naming conventions, standards, guidelines or specifications that you need to follow;</li> <li>• Knowledge of the technical processes that will be used in the finished product;</li> <li>• Understanding the different types of rendering effects that can be applied to animation objects and environments;</li> <li>• Knowledge of the effects of camera positions and angles, lighting and reflection on the appearance of animation objects and environments;</li> <li>• Understanding the implications for animation of the interactive environment and the non-linear nature of IMP/S (e.g. the need to plan for points of view or movements you may not have anticipated).</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow specifications or other briefs;</li> <li>• Ability to use appropriate modelling and animation software;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to clearly document animations so that others can use them easily (for example, so that developers can code scripts to access specific frames or scenes);</li> <li>• Ability to supply textures to supplied wire-frame models to test the integrity of rendered objects or environments to ensure they appear correctly from all required positions and angles;</li> <li>• Ability to ensure that the animations provided can be rendered at the required speed and quality within the capabilities of the target platform;</li> <li>• Ability to portray realistic movements that are appropriate to the type of object being modelled and the style of animation required;</li> <li>• Ability to test the integrity of wire-frame models to ensure they appear correctly from all required camera positions and angles;</li> <li>• Ability to create prototype animations as necessary to check the integrity of the movement;</li> <li>• Ability to supply animation assets in an appropriate format;</li> <li>• Ability to organise animation assets using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>• Ability to liaise with colleagues as appropriate to test animation assets and ensure they are appropriate and meet requirements.</li> </ul>

Competency	<b>A3. Produce the music and sound effects for interactive media product/service (IMP/S)</b>
Description	<p>The ability to create sound effects, compose and record music that work in an interactive context.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Sound forge</i></li> <li>• <i>WaveLab</i></li> <li>• <i>Peak</i></li> <li>• <i>CoolEdit</i></li> <li>• <i>ProTools</i></li> <li>• <i>Nuendo</i></li> <li>• <i>Logic Audio</i></li> <li>• <i>Cubase</i></li> <li>• <i>ProTools</i></li> <li>• <i>Nuendo</i></li> <li>• <i>Gigastudio</i></li> </ul>
Examples of job titles	Audio Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Edit existing audio material to create sound effects to meet a brief or specification;</li> <li>• Compose music that is appropriate for the purpose and mood of the product;</li> <li>• Systematically assess the implementation of work in iterative versions and specify changes in effects, volume, pitch and panning;</li> <li>• Liaise with the relevant authority to obtain approval for sound effects and music;</li> <li>• Record music in an appropriate format that can be reproduced within the capabilities of the target platforms;</li> <li>• Provide clear documentation and audio demonstration clips as necessary for others to incorporate sound effects and music into the product;</li> <li>• Organise sound effects and music using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>• Liaise with colleagues, such as designers and developers, to ensure sound effects and music are appropriate and meet requirements.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Generate original sound effects to meet a brief or specification;</li> <li>• Create music that can respond to events and user interactions as required.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of the principles sound design, sound effects and acoustics;</li> <li>• Understanding effect of audio sampling-rates and bit-depth on file-size and data-transfer rates;</li> <li>• Knowledge of when and why a sound effect might be cut-off</li> </ul>

	<p>prematurely, and how to minimise the risk of this adversely affecting the product;</p> <ul style="list-style-type: none"> <li>• Knowledge of the various types of data compression and their relative merits and demerits;</li> <li>• Knowledge of different formats in which music can be output, and when it would be appropriate to use them;</li> <li>• Knowledge of events or user interactions that will trigger sound effects in the product;</li> <li>• Understanding of how sound effect and/or will be used in the product (for example, whether it will play once, loop several times or indefinitely etc.);</li> <li>• Understanding what is required for the music to change in response to events or user interactions (for example by changing key or tempo, or by segueing into another piece);</li> <li>• Knowledge of compatibility issues between mono, stereo, multi-channel and surround sound;</li> <li>• Understanding when permission is needed to use material created by others;</li> <li>• Understanding the limits of what can be legally done with material created by others before permission is needed;</li> <li>• Knowledge of relevant naming conventions, standards, guidelines or specifications</li> <li>• Understanding requirements and expectations of other team members who will use the sound effects created;</li> <li>• Knowledge of the different technologies used in a computer-based music studio, including samplers, sequencers, MIDI devices, 'outboard' recording studio hardware and mixing desks.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow specifications or other briefs;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to locate sources of audio material suitable for meeting the creative brief;</li> <li>• Knowledge of the types of audio effects that are available and their suitability for different products and contexts;</li> <li>• Ability to use sound effects to enhance the user's experience and/or give feedback on user interactions;</li> <li>• Knowledge of the appropriate file formats for saving sound effects;</li> <li>• Ability to layer sounds to achieve a combined audio effect or to produce a complex replay of elements with logical replay rules;</li> <li>• Ability to use various techniques for synchronising sounds to moving images;</li> <li>• Ability to record, edit and implement post production of dialogue;</li> <li>• Ability to assess and specify music requirements as necessary;</li> <li>• Ability to sample audio from legitimate sources and use sound samples in your composition;</li> <li>• Ability to use appropriate software to record, sequence and mix audio;</li> <li>• Ability to address the challenges of scoring music for non-linear medium with scenes of indeterminate length by employing techniques like branching segments and the use of music layers mixed dynamically at run-time.</li> </ul>

Competency	<b>A4. Produce video for interactive media product/service (IMP/S)</b>
Description	<p>The ability to produce and stream video in an interactive context, with a focus on video post-production, effects and compositing.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe AfterEffects</i></li> <li>• <i>Adobe Premier</i></li> <li>• <i>Avid</i></li> <li>• <i>Flash Media Server</i></li> <li>• <i>FinalCut</i></li> </ul>
Examples of job titles	Digital Video Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Correctly prepare video files for post-production and compositing;</li> <li>• Set time code to meet post production requirements;</li> <li>• Synchronise time code with other sources, or provide a master reference;</li> <li>• Clearly mark the video media files for identification.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Generate composited video to meet a brief or specification;</li> <li>• Create video that can respond to events and user interactions as required;</li> <li>• Create video streaming appropriate to the requirements of the IMP/S.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of the principles video design, post-production and streaming;</li> <li>• Understanding effect of video sampling-rates and bit-depth on file-size and data-transfer rates;</li> <li>• Knowledge of different formats, codecs, compression and streaming methods in which video can be output, and when it would be appropriate to use them;</li> <li>• Knowledge of events or user interactions that will trigger video effects in the product;</li> <li>• Understanding when permission is needed to use material created by others;</li> <li>• Knowledge of the different technologies used in a computer-based video studio, including post-production, compositing and streaming applications;</li> <li>• Knowledge of post production requirements for correct time codes;</li> </ul>

	<ul style="list-style-type: none"> <li>• Knowledge of the differences in cost and functionality between true streaming (using a streaming server) and progressive download;</li> <li>• Knowledge of the streaming media object model including the connection, session and stream objects.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to locate sources of video material suitable for meeting the creative brief;</li> <li>• Ability to use video effects and compositing techniques as appropriate for different products and contexts;</li> <li>• Ability to use video effects to enhance the user's experience and/or give feedback on user interactions;</li> <li>• Ability to use various techniques for synchronising images with sound or dialogue;</li> <li>• Ability to assess and specify video requirements as necessary;</li> <li>• Ability to sample video from legitimate sources and use samples in the composition;</li> <li>• Ability to use appropriate editing , compositing and streaming applications;</li> <li>• Ability to provide safe storage for the video files;</li> <li>• Ability to create streaming video applications using streaming servers or progressive download.</li> </ul>

## ART & TECHNOLOGY COMPETENCY PROFILE

### Amended Art & Technology program production pipeline & professional competency profile

IMP/S: Interactive media product or service

Role ► Phase ▼	Concept Development	Technology	Art (Visual Design)	Management & Quality Assurance	Commercial interface
STRATEGY					
Define IMP/S	C1. Provide creative and strategic direction for projects				C8. Business & Management
CREATION & DEVELOPMENT					
Design, create, develop and manage IMP/S	C2. Create the functional design			C5. Project Management	
	C3. Create the visual design			C6. Quality Assurance	
	C4. Create the content design			C7. Management of self & others	
PRODUCTION					
Plan, implement and manage the production of IMP/S		T1. Contribute to establishing functional and technical processes to implement design	A1. Produce user face assets and style sheets		
		T2. Implement functionality	A2. Produce 2D&3D animations		
			A3. Produce sound and music effects		
			A4. Produce video		
SUPPORT					
Exploitation & Optimisation					



## Art & Technology Program Competencies

These are largely based on the UK's *National Occupational Standards for Interactive Media and Computer Games* (Skillset 2005) and also have some references to the *NAME Project-Nomenclature Analysis of European Multimedia* (Bahry 2002). Below is a glossary to assist with terminologies used in the competencies (Skillset, 2005).

### Glossary

#### **Appropriate people**

*Depending on the work environment, appropriate people from whom to seek feedback might include the client; manager, the editor; peer colleagues; proofreaders; subject matter experts; or representatives of the target audience. There could be others; the point is to seek feedback from people who are entitled, or who are in a position, to contribute to the effectiveness of work produced.*

#### **Project sponsors**

*These could include the project's client, internal or external decision makers, internal account handlers or third-party stakeholders, such as investors or publishers.*

#### **Product**

*This term is used to define the outcome of an interactive media development project. In some sub-sectors or areas of activity, other terms, such as 'solution' or 'deliverable' may be more appropriate.*

#### **Product information**

*Information about the product, such as its intended purpose and target audiences, or factors relevant to the context in which the product is developed, such as the project sponsor's brand identity, organisational aims and objectives, internal processes, stakeholders etc. Such information may be provided in a brief or other documentation such as corporate literature, or may need to be identified through a discovery process.*

#### **Design parameters**

*Factors that will influence or constrain the design of the product, such as the expectations and requirements of the target audience, the capabilities of the technologies being used, the nature of the product's content, and any business strategy underpinning its development*

## Core Competencies

Competency	<b>C1. Provide creative and strategic direction for interactive media projects</b>
Description	<p>Ability to understand and specify the product's commercial requirements and/or purpose.</p> <p>These roles require expertise in business, management, content, design and technical disciplines and have a close relationship with project management. However this function focuses on the project's creative requirements rather than the mechanics of running it. In reality, the two functions are often combined.</p>
Examples of job titles	Producer, Project Director
Criteria regarding product and process (also referred to as indicators)	<p>Criteria in regards to process</p> <ul style="list-style-type: none"> <li>• Collaborate with the project sponsors to: <ul style="list-style-type: none"> <li>- Identify existing design solutions which meets the parameters of the brief and select possible adaptations which will contribute to design ideas for further consideration;</li> <li>- Evaluate potential design adaptations against significant parameters of the design brief;</li> <li>- Discard options which fail to meet design parameters and identify alternatives which offer significant advantages over discarded options;</li> <li>- If it is not possible to produce one solution that meets all requirements of the brief, assess realistic changes to the design brief and make recommendations;</li> <li>- Assess realistically the implication of modifying the design brief and record the outcomes;</li> </ul> </li> <li>• Combine creative, logical and analytical thinking;</li> <li>• Contribute to project teams and specialists;</li> <li>• Ensure the project's business objectives and creative vision are clearly defined and met.</li> </ul> <p>Criteria in regards to product</p> <ul style="list-style-type: none"> <li>• Originate conceptual ideas, usually in consultation with others;</li> <li>• Produce written or drawn design documentation to produce a fit for purpose product or service in line with initial specifications required by the decision makers and the targeted market.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding of market developments, new technologies,</li> </ul>

	<p>techniques and best practice;</p> <ul style="list-style-type: none"> <li>• Understanding of the different technologies, tools, formats, and creative or technical approaches that are available and their advantages, disadvantages and implications;</li> <li>• Understanding the nature, constraints, opportunities and parameters of the platforms technologies and media;</li> <li>• Understanding of common problems, design changes and contingencies that may occur in a project and how to manage their impact;</li> <li>• Knowledge of different sources of existing design options;</li> <li>• Knowledge of different types of evaluation for testing existing design solutions;</li> <li>• Understanding the needs and expectations of the organisation's design and production staff;</li> <li>• Understanding of the different specialist skills that may be required for a given project ;</li> <li>• Understanding the nature of the client's business and the context in which the product is required;</li> <li>• Understanding of the inter-relations between content, design and technology;</li> <li>• Understanding the importance of sound project management processes, including the need to obtain approval for one key stage before proceeding to the next.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to identify and select which technologies, tools, and creative or technical approaches would be most appropriate to use;</li> <li>• Ability to use text and diagrams or drawings to create clear and accurate specification documents from which the product can be designed;</li> <li>• Ability to explain technical or specialist issues or work to non-technical people or to specialists in other areas;</li> <li>• Ability to seek and respond constructively to advice or feed back from decision makers concerning the quality, fitness for purpose, or any other aspect of the project;</li> <li>• Ability to conduct discussions and negotiations in a way that promotes co-operation and goodwill;</li> <li>• Ability to devise and implement contingency plans for reasonably foreseeable setbacks that might affect the ability to deliver work on time.</li> </ul>

Competency	<b>C2. Create the functional design of interactive media product/service (IMP/S)</b>
Description	<p>The ability to design the overall product concept and functionality, and specify this through appropriate documentation.</p> <p>The ability to interpret high-level requirements to devise an appropriate solution, including, user experience, interface specification and enabling technologies.</p>
Examples of job titles	Technical Lead, Technical Director, User Experience Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Combine creative, logical and analytical thinking;</li> <li>• Use of a range of relevant enabling technologies to demonstrate functionality;</li> <li>• Devise end-user features such as navigational or functional devices;</li> <li>• Prepare design briefs or give instructions to technical developers;</li> <li>• Devise and document game rules (electronic games);</li> <li>• Specify the characteristics of the game world i.e. attributes and behaviours of objects and characters in sufficient detail for realisation by others (electronic games).</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Produce functioning prototypes;</li> <li>• Produce document of technical specifications;</li> <li>• Present a game design that is fun and playable (electronic games).</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding of the different creative and technical approaches that are available;</li> <li>• Knowledge of the relevant technologies and their capabilities;</li> <li>• Understanding the nature of the client's business and the context in which the product is required;</li> <li>• Understanding of the target audience and their expectations and preferences;</li> <li>• Understanding the impact on the product/service design of technical parameters such as the target device's processing power, memory, bandwidth, screen size, resolution, colour depth, input device etc.;</li> <li>• Knowledge of relevant standards, conventions and guidelines;</li> <li>• Understanding of requirements for localisation, and the impact of these on the product architecture.</li> </ul>

	<ul style="list-style-type: none"><li>• Knowledge of the relevant principles and methodology of software engineering;</li><li>• Knowledge of theories of game design (electronic games);</li><li>• Knowledge of different genres of game and the types of audience they appeal to (electronic games)</li></ul>
Skills	<ul style="list-style-type: none"><li>• Ability to obtain and analyse product information to determine relevant design parameters;</li><li>• Ability to specify functionality and decide how end-user features should operate;</li><li>• Ability to develop user personas, usage scenarios and user journeys;</li><li>• Ability to design content structures, navigational devices and interface functions that are appropriate to the target users and product purpose;</li><li>• Ability to devise appropriate naming, coding or mapping conventions for documenting the product structure;</li><li>• Ability to select and specify features that will assist usability, navigation and location of content;</li><li>• Ability to liaise with colleagues to ensure the product design and user interface are suitable for the product's intended purpose and audience;</li><li>• Ability to document specifications and designs in appropriate formats and in sufficient detail to serve as a blueprint for the product development i.e. using text, drawings, wire-frames, storyboards, maps or diagrams.</li></ul>

Competency	<b>C3. Create the visual design of interactive media product/service (IMP/S)</b>
Description	<p>The ability to design the “look and feel” of the user interface for a product and ensure that all the required visual assets are created and available in the right format and prepared for its technical implementation.</p> <p>Some examples of industry-standard software used:</p> <ul style="list-style-type: none"> <li>• <i>Adobe ImageReady</i></li> <li>• <i>Adobe Fireworks</i></li> <li>• <i>Equilibrium DeBabelizer</i></li> <li>• <i>Terran Interactive Media Cleaner</i></li> <li>• <i>Adobe Photoshop</i></li> <li>• <i>Adobe Illustrator</i></li> <li>• <i>Adobe Freehand</i></li> <li>• <i>Flash</i></li> </ul>
Examples of job titles	Web Designer, Interface Designer, Interaction Designer, Production Assistant, Web Developer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Design static and animated visual components;</li> <li>• Specify how elements should respond to user interaction.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• The required component assets are created and available in the right format;</li> <li>• Visuals for user interfaces and/ or environments are produced;</li> <li>• Designs conform to good visual design principles.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding the product's purpose and target users;</li> <li>• Understanding the expectations and requirements of target users;</li> <li>• Knowledge of the constraints and parameters within the design including target platforms and their capabilities for delivering assets;</li> <li>• Knowledge of relevant standards and conventions relating to user-interface design and industry-standard software tools;</li> <li>• Knowledge of colour theory i.e. the effect of image colour-depth, resolution and dimensions on file-size;</li> <li>• Understanding of usability and accessibility issues relating to graphical or audio interface components;</li> <li>• Knowledge of the principles of typography;</li> <li>• Knowledge of the relevant sources of additional assets, such as sound libraries etc. When rights clearances are needed to use assets;</li> <li>• Knowledge of visual design theory – principles and elements of visual design.</li> </ul>

	<ul style="list-style-type: none"> <li>• Knowledge of good visual communication vocabulary;</li> <li>• Knowledge of the role of storyboards and concept art to communicate visual ideas.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow a design brief or other instructions;</li> <li>• Ability to design within specified parameters and constraints relating to the target platform and medium;</li> <li>• Ability to design end user features to facilitate the use of interactive products;</li> <li>• Ability to select and agree the visual style and interactive character of products;</li> <li>• Ability to design interfaces or environments that are attractive, easy to use and fit for purpose;</li> <li>• Ability to liaise with colleagues to ensure the designs can be implemented within the available resources and project parameters;</li> <li>• Ability to deliver designs in appropriate formats so that they can be easily implemented;</li> <li>• Ability to specify where and when additional assets, such as sounds and animations should be incorporated into the interface;</li> <li>• Ability to provide documentation or instructions as required to ensure that others have the necessary information to implement the design properly;</li> <li>• Ability to use digital image manipulation tools;</li> <li>• Ability to use digital video and audio editing tools;</li> <li>• Ability to achieve appropriate file-sizes and efficient data-transfer rates while maintaining asset quality;</li> <li>• Ability to select or create appropriate colour palettes for graphical interface assets;</li> <li>• Ability to draw on visual design elements principles to create good visual design;</li> <li>• Ability to communicate visual ideas verbally;</li> <li>• Ability to communicate visual ideas with storyboards, thumbnails and concept art.</li> </ul>

<b>Competency</b>	<b>C4. Create the content design of interactive media product/service (IMP/S)</b>
<b>Description</b>	<p>The ability to plan, write and/or edit the content of an interactive media product. This could range from short user instructions to entire web pages.</p> <p>The ability to provide a brief or guidance for copywriters, editors, illustrators, animators etc. in collaboration with the Producer's specifications. At times, there is a requirement to liaise with intellectual property specialists to obtain rights to use material owned by others.</p>
<b>Examples of job titles</b>	Content Strategist, Content Director, Webmaster, Copywriter, Copy Editor
<b>Criteria regarding product and process (also referred to as indicators)</b>	<p><b>Criteria regarding process</b></p> <ul style="list-style-type: none"> <li>Identifying key messages, themes, tone and personality for written content;</li> <li>Specifying visual or other assets</li> <li>Developing house styles and publishing guidelines.</li> <li>Determine the content and style of text-based content;</li> <li>Be responsible for the overall direction and quality of the text-based content.</li> </ul> <p><b>Criteria regarding product</b></p> <ul style="list-style-type: none"> <li>Create and develop content in response to a detailed or sketchy brief, or write up an original idea.</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>Knowledge of different styles of writing and their suitability for different audiences and communication objectives;</li> <li>A wide knowledge of cultural, historical, popular and literary influences which can be used to enhance and amplify the message;</li> <li>Knowledge of relevant theories and principles of Media, Communication, Cognitive and Narrative theories;</li> <li>Understanding of the characteristics and appeal of different genres of story telling;</li> <li>Knowledge of any relevant conventions, style guides or policies that you need to follow;</li> <li>Understanding of usability issues and relevant accessibility standards and guidelines;</li> <li>Knowledge of any requirements for localisation, and the impact of these on the product content;</li> <li>Understanding of content management systems;</li> <li>Understanding of organisational processes, resource issues, or other factors that may affect the project sponsor's on-going ability to create, update and manage content;</li> </ul>



	<ul style="list-style-type: none"> <li>• Knowledge of the legal and contractual implications of using material in which others hold intellectual property rights;</li> <li>• Knowledge of relevant legislation concerning intellectual property, copyright, libel and obscenity.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to obtain and analyse product information to identify messages and themes for the content;</li> <li>• Ability to devise appropriate writing styles;</li> <li>• Ability to use instructional text to enhance the product's usability, and when it may be needed;</li> <li>• Ability to make creative connections from a wide range of cultural, historical popular and literary influences to enhance the effectiveness of the text;</li> <li>• Ability to check the reliability and currency of any information sources you use;</li> <li>• Ability to write text that takes account of search-engine optimisation techniques while remaining attractive and readable for humans;</li> <li>• Ability to develop and document guidance, styles and policies for writers and other content contributors that are clear, realistic, relevant and easy to access;</li> <li>• Ability to write in a consistent style suitable for the target audience and the purpose of the communication;</li> <li>• Ability to structure the text-based content so that it is easy to read and navigate;</li> <li>• Ability to follow relevant writing conventions, style guides and policies;</li> <li>• Ability to proof-read copy to check for spelling, grammatical, typographic or other errors;</li> <li>• Ability to check that any facts and figures that are quoted are accurate;</li> <li>• Ability to comply with relevant legislation.</li> </ul>

Competency	<b>C5. Project Management for the creation, development and production of interactive media product/service (IMP/S)</b>
Description	<p>The ability to contribute to translating the basic design documentation into a plan and schedule for production. The ability to work effectively with the designated leader to execute the process.</p> <p>Some industry-standard tools used are:</p> <ul style="list-style-type: none"> <li>• <i>MAVEN</i></li> <li>• <i>CMI</i></li> <li>• <i>ACRUP</i></li> <li>• <i>ANT</i></li> <li>• <i>AGILE</i></li> </ul>
Examples of job titles	Project Manager, Studio Manager
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Address multiple demands without losing focus or energy;</li> <li>• Recognise changes in circumstances promptly and adjust plans and activities accordingly;</li> <li>• Find practical ways to overcome barriers;</li> <li>• Keep the team informed of plans and developments;</li> <li>• Present information clearly, concisely, accurately and in ways that promote understanding;</li> <li>• Monitor the quality of work and progress against plans and take appropriate corrective action, where necessary;</li> <li>• Create a sense of common purpose;</li> <li>• Ensure that the team manages their tasks to meet the requirements of the project.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Ensure the schedule is achievable within budget and stipulated time frame.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of agreed key objectives and scope of the project and the available resources;</li> <li>• Understanding of the overall organizational, vision, objectives, plans, policies, practices and activities that may affect the project and any other project currently operating;</li> <li>• Understanding the roles and key responsibilities of all team members;</li> <li>• Knowledge of the principles, processes, tools and techniques for managing projects commonly used in the industry;</li> <li>• Knowledge and oversight of production processes;</li> <li>• Understanding of people-management skills such as teambuilding, motivation, facilitation of problem solving and communication;</li> </ul>

	<ul style="list-style-type: none"> <li>• Understanding of the basic principles, methods and techniques of total quality management including knowledge of the appropriate financial tracking tools;</li> <li>• Understanding risks and contingencies common to the industry/sector;</li> <li>• Knowledge of sector relevant ISO standards legislation, regulations, guidelines, best practices and codes of practice ;</li> <li>• Understanding of required documentation.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to analyse, breakdown and implement the design brief into its components;</li> <li>• Ability to develop a project schedule for team members;</li> <li>• Ability to analyse and balance the different forces acting on the development project;</li> <li>• Ability to analyse and refine working practices;</li> <li>• Ability to manage, motivate, plan, monitor, and assess people through knowledge, ideas and new approaches;</li> <li>• Ability to assess and manage risk;</li> <li>• Ability to manage change within projects;</li> <li>• Ability to monitor the project so that it achieves the stated objectives in the most effective and efficient way, on time and within the budget;</li> <li>• Ability to provide support to allow the project team to perform efficiently and effectively;</li> <li>• Ability to integrate quality processes and use the feedback to implement further improvements.</li> </ul>

Competency	<b>C6. Quality Assurance of interactive media product/service (IMP/S) in all stages of the production pipeline.</b>
Description	<p>The ability to make recommendations about how the product might need to be changed as a result of quality testing as all stages of development need to conform to various International, Industry and in-house standards.</p> <p>Designing, conducting and evaluating user tests are crucial elements of the iterative process and ensure a product or product design is:</p> <ol style="list-style-type: none"> <li>4. Fit for its intended purpose;</li> <li>5. Usable by its intended users;</li> <li>6. Of sufficient quality.</li> </ol>
Examples of job titles	Tester, Quality Assurance Manager
Criteria regarding product and process (also referred to as indicators)	<p>10.1.1.1.1.3 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>• Ensure that all development processes conform to relevant standards;</li> <li>• Design, conduct and evaluate a test procedure;</li> <li>• Select and recruit test observers/facilitators where appropriate, and ensure they are properly briefed about the objectives of the test and its assessment criteria;</li> <li>• Track and rectify errors and implement improvements based on feedback produced by the test procedure;</li> <li>• Document activities and tasks accurately and in an appropriate format;</li> <li>• Recommend design changes arising from the test results to the appropriate party.</li> </ul> <p>10.1.1.1.1.4 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>• A product or service that is compliant with all relevant standards;</li> <li>• A systematic and effective bug-tracking database;</li> <li>• An efficient, optimized and effective IMP/S.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of sector relevant ISO standards, W3C Web standards, legislation, regulations, guidelines, best practices and codes of practice. These will include standards for usability, accessibility and other W3C web standards;</li> <li>• Knowledge of relevant theoretical domains such as Human-Computer Interaction (HCI), Engagement/Immersion, Communication and Media theory etc.;</li> <li>• Knowledge of the needs of the target group;</li> <li>• Knowledge of the product throughout its development cycle;</li> <li>• Understanding of the tracking process and documentation of various aspects of the project throughout the QA test cycle (reports, updates, resources, budgets, etc);</li> <li>• Knowledge of test strategies procedures and where to source</li> </ul>

	<ul style="list-style-type: none"><li>• testing resources;</li><li>• Knowledge of suitable qualitative and quantitative procedures and processes to evaluate testing processes.</li></ul>
Skills	<ul style="list-style-type: none"><li>• Ability to accurately interpret relevant standards documentation;</li><li>• Ability to implement relevant international, industry and in-house standards effectively;</li><li>• Ability to select testing methods capable of generating valid data about the overall product design;</li><li>• Ability to plan, organise and schedule the testing cycles;</li><li>• Ability to recognise, track, organise and manage bugs;</li><li>• Ability to analyse qualitative and quantitative data;</li><li>• Ability to liaise diplomatically with relevant colleagues, in particular designers and developers, to negotiate changes to the design or implementation;</li><li>• Ability to evaluate testing process and implement improvements based on test feedback.</li></ul>

<b>Competency</b>	<b>C7. Managing self &amp; others</b>
<b>Description</b>	<p>The ability to manage oneself effectively and develop productive working relationships with internal and external parties.</p> <p>The ability to understand the relevant industry, corporate, technological, and creative domains.</p> <p>The ability to continuously update skills and knowledge in these domains.</p>
<b>Examples of job titles</b>	Not applicable
<b>Criteria regarding product and process (also referred to as indicators)</b>	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Conduct discussions and negotiations in a way that promotes co-operation and goodwill;</li> <li>• Seek and respond constructively to advice or feed back from appropriate people concerning the quality, fitness for purpose, or any other aspect of, your work;</li> <li>• Comply with legal requirements, industry regulations, organisational policies and professional codes;</li> <li>• Contribute to an atmosphere of professionalism and mutual support;</li> <li>• Present information clearly, concisely, accurately and in ways that promote understanding;</li> <li>• Take personal responsibility for making things happen;</li> <li>• Able to take decisions autonomously while acting within the limits of given authority;</li> <li>• Demonstrate integrity, fairness and consistency in decision-making;</li> <li>• Understand people's needs and modelling behaviour that shows respect, helpfulness and co-operation;</li> <li>• Manage continuing professional development;</li> <li>• Maintain up-to-date awareness of industry developments, new technologies, techniques and best practice.</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Understanding principles of effective communication and how to apply them in order to communicate effectively with colleagues and stakeholders.</li> <li>• Understand and take account of the priorities, expectations and authority of colleagues and stakeholders in decisions and actions.</li> <li>• Knowledge of the relevant regulations, standards and codes of practice, behaviour and performance.</li> <li>• Knowledge of different genres of written communication for specific audiences i.e. formatting and styles;</li> <li>• Knowledge of the principles and practices of effective interpersonal communication;</li> </ul>

	<ul style="list-style-type: none"> <li>• Knowledge of the English language</li> <li>• Understanding of cross cultural issues in communication;</li> <li>• Knowledge that different styles of management exist;</li> <li>• Knowledge of difficulties and challenges that may arise, including conflict, diversity and inclusion issues within the team, and ways of identifying and overcoming them;</li> <li>• Knowledge of appropriate resources to update skills and knowledge such as newsgroups, mailing lists, web sites, seminars, courses, networking opportunities etc.;</li> <li>• Knowledge of research methods and techniques.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to identify your organisation's stakeholders including background information and the nature of their interest in your organisation;</li> <li>• Ability to present ideas to colleagues and gain their support;</li> <li>• Ability to establish working relationships with all colleagues;</li> <li>• Ability to recognise, agree and respect the roles and responsibilities of colleagues;</li> <li>• Ability to communicate and listen effectively and take into account individual and cultural differences;</li> <li>• Ability to contribute to encouraging and supporting team members to achieve their personal work objectives and those of the team and provide recognition when objectives have been achieved or when there have been setbacks or change;</li> <li>• Ability to identify and sort out conflicts of interest and disagreements with colleagues in ways that minimise damage to work being carried out;</li> <li>• Ability to give and receive frank and constructive feedback;</li> <li>• Ability to respond constructively to feedback, whether negative or positive;</li> <li>• Ability to encourage and recognise creativity and innovation within the team;</li> <li>• Ability to write for different audiences;</li> <li>• Ability to use written business and technical terminology accurately and effectively using the appropriate format and style in English;</li> <li>• Ability to structure written material appropriately;</li> <li>• Ability to adapt style of interpersonal communication e.g. intonation, inflexion, business or technical terminology and vocabulary, to suit audience needs;</li> <li>• Ability to effectively facilitate personal and professional development.</li> </ul>

Competency	<b>C8. Business and Management</b>
Description	<p>The ability to manage business processes to ensure that organisation delivers outputs that meet customers and stakeholders' needs, and organisational and legal requirements.</p> <p>The ability to ensure that relevant and reliable information about the organisation's market and customers is accessible.</p>

	The ability to develop, implement and evaluate business plans.
Examples of job titles	Account Manager, New Business Developer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Identify and prioritise business objectives;</li> <li>• Develop and agree on business plans and budgets for the achievement of the organisational strategies, setting out clear actions, risks, contingencies, accountabilities and milestones;</li> <li>• Identify and provide the business resources required;</li> <li>• Take account of influences that may affect and shape how business processes work;</li> <li>• Develop business process measures that are affordable and appropriate;</li> <li>• Identify customers' needs, expectations and predicted future demand levels;</li> <li>• Identify and assess current and future developments in your sector, including competitors' activities;</li> <li>• Identify and assess threats to and weaknesses in, the organisation's business plan;</li> <li>• Monitor and report on the implementation and performance of the plan against milestones and budgets.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Effective and sustainable business processes and resources;</li> <li>• Implement effective methods to review and improve business and marketing plans</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of principles, models and measurement tools for effective business management;</li> <li>• Understanding of business decision making for risk and reward against potential investment cost;</li> <li>• Knowledge of the sector trends, market developments and competitor performance that affect business processes.</li> <li>• Knowledge of organisation's aims, goals, structure, values, culture, products, services and processes;</li> <li>• Knowledge of the sources of professional market-research expertise;</li> <li>• Knowledge of methods of gaining customer feedback, and the costs and benefits associated with them.</li> <li>• Knowledge of information software products that assist with collecting and analysing information.</li> <li>• Understanding how to secure competitive advantage;</li> <li>• Knowledge of the legal and regulatory restrictions that may affect the organization's business plans;</li> <li>• Knowledge of Industry/sector and organization's requirements for developing and implementing business plans;</li> <li>• Knowledge of sources of advice, and support from business and marketing specialists.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to define business processes and ensure that these are</li> </ul>



	<p>sustainable and effective in their use;</p> <ul style="list-style-type: none"><li>• Ability to identify, develop and prioritise business objectives that are consistent with the organisation's overall business plan;</li><li>• Ability to assess risk and reward against their potential investment cost;</li><li>• Ability to effectively communicate business plans to relevant stakeholders to ensure understanding and commitment;</li><li>• Ability to respond positively and creatively to setbacks.</li><li>• Ability to comply with, legal requirements, industry regulations, organisational policies and professional codes.</li><li>• Ability to monitor the quality of business performance and progress against plans and take appropriate corrective action, where necessary;</li><li>• Ability to identify trends and recognise their impact upon current and future business performance;</li><li>• Ability to obtain advice and support from business and marketing specialists;</li><li>• Ability to implement, monitor and report on the business plan as agreed and within budget and milestones;</li><li>• Ability to develop and implement measures and methods for evaluating the implementation of the business plan.</li></ul>
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## Competencies for Digital Technicians

Competency	<b>T1. Contribute to establishing functional and technical processes to implement design of IMP/S</b>
Description	<p>The ability to determine the implementation of designs for IMP/S.</p> <p>The ability to understand functional, design, or other specifications and determine the best way to build the product.</p>
Examples of job titles	Technical Lead, Technical Director
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>Analyse product information, designs and specifications to identify technical requirements and parameters;</li> <li>Evaluate relevant technologies, development or authoring tools, mark-up, scripting or programming languages, and approaches, and decide which are appropriate to use;</li> <li>Determine if and which standards or guidelines must be adhered to;</li> <li>Document research and development activity in the form of technical specifications;</li> <li>Undertake research and develop prototypes as appropriate in order to test ideas, approaches, technologies and tools;</li> <li>Maintain up-to-date knowledge and awareness of current technologies, languages, tools and best practice that are relevant to interactive media product development;</li> <li>Liaise with colleagues to ensure functional specifications are workable;</li> <li>Liaise with the relevant party to obtain approval for functional specifications and decisions.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>Develop prototypes as appropriate to prove ideas, approaches, technologies and tools.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>Knowledge of relevant technical standards and guidelines;</li> <li>Knowledge of different mark-up, scripting and programming languages;</li> <li>Knowledge of authoring tools, development environments and coding tools;</li> <li>Knowledge of relevant and appropriate technologies;</li> <li>Understanding the IMP/S's overall purpose, intended use and requirements, in particular relating to any integration with other systems and any likely future need for maintenance or modification;</li> </ul>

	<ul style="list-style-type: none"> <li>• Knowledge of information sources about latest technologies, approaches, best practice and current trends in the use of interactive media technologies and tools;</li> <li>• Knowledge of the resources, capabilities and skills within an organisation and/or available to the project;</li> <li>• Knowledge of interaction design issues.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow functional specifications or other briefs;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to identify project parameters and constraints including target platforms and their capabilities;</li> <li>• Ability to identify and select appropriate approaches, technologies, mark-up, scripting or programming languages, development environments and other tools with which to develop the product;</li> <li>• Ability to appropriately use particular technologies, approaches, languages or tools, and the implications of doing so.</li> </ul>

Competency	<b>T2. Implement functionality of interactive media product/service (IMP/S)</b>
Description	<p>The ability to create and deploy the overall product, using an appropriate front-end and back-end development environment (i.e. the authoring tools, scripting language, programming language).</p> <p>Some industry-standard tools used:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Flash</i></li> <li>• <i>Adobe Dreamweaver</i></li> <li>• <i>Adobe GoLive</i></li> <li>• <i>Microsoft FrontPage</i></li> <li>• <i>Microsoft Silverlight</i></li> <li>• <i>ActionScript</i></li> <li>• <i>JavaScript</i></li> <li>• <i>VBScript</i></li> <li>• <i>Python</i></li> <li>• <i>Java</i></li> <li>• <i>Adobe Flex</i></li> <li>• <i>Ajax</i></li> <li>• <i>MySQL</i></li> <li>• <i>Perl</i></li> <li>• <i>C</i></li> <li>• <i>C++</i></li> <li>• <i>C#</i></li> <li>• <i>Air</i></li> <li>• <i>ASP.net</i></li> <li>• <i>Objective-c</i></li> <li>• <i>PHP</i></li> </ul>
Examples of job titles	Web Developer, Web Programmer, Multimedia Programmer, Game Programmer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Assemble, organise and check the required content and assets;</li> <li>• Select and use a development environment to develop functionality according to provided specifications;</li> <li>• Code effectively to provide specified functionality;</li> <li>• Test and debug the product to ensure it operates correctly within specified parameters;</li> <li>• Fix any bugs or problems that come to light from testing;</li> <li>• Liaise with colleagues to ensure functional designs and specifications are correctly implemented;</li> <li>• Respond positively to requests for changes arising from user testing and changes to work schedules and timescales.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Produce code that is readable, re-usable and maintainable;</li> <li>• Clearly document code so that others can understand it;</li> <li>• Deploy the finished product in the appropriate format.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of relevant programming principles and best practice (such as object-oriented and/or procedural programming);</li> <li>• Knowledge of the principles of interaction design and especially issues of usability and accessibility;</li> <li>• Understanding the functions and syntax of the scripting and/or programming language being used;</li> <li>• Knowledge of available development environments, their advantages and disadvantages, and when it is appropriate to</li> </ul>

	<p>use them;</p> <ul style="list-style-type: none"><li>• Knowledge of project parameters and constraints including target platforms and their capabilities;</li><li>• Knowledge of the format in which the product will be deployed (for example, web, CD-Rom, DVD, mobile device, etc.);</li><li>• Knowledge of the sources of information for help, tips and tricks for making most effective use of the development environment being used;</li><li>• Knowledge of the implications of requests for changes to functionality;</li><li>• Understanding the expectations of others who may be involved in debugging, using or modifying the code;</li><li>• Understanding of data structures and how they contribute to the functionality of IMP/S;</li><li>• Knowledge of any limitations of the chosen development environment that may affect the smooth operation and usability of the product being created or capacity to de-bug it easily.</li></ul>
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Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow functional specifications or other briefs;</li> <li>• Ability to clarify requirements or raise issues in response to the functional specification or brief;</li> <li>• Ability to write efficient code that is easy to read, debug and maintain;</li> <li>• Ability to use chosen development environment;</li> <li>• Ability to clearly document code;</li> <li>• Ability to test and debug code efficiently;</li> <li>• Ability to write custom debugging code and have additional expertise in some of the following areas:             <ol style="list-style-type: none"> <li>1. Physics programming</li> <li>2. Graphics programming</li> <li>3. Network programming</li> <li>4. Artificial Intelligence programming</li> <li>5. Logic/mathematical skills</li> </ol> </li> <li>• The ability to structure data in order to achieve functionality;</li> <li>• The ability to meet deadlines in relation to the quality of outputs against the specification.</li> </ul>
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## Competencies for Visual Artists

Competency	<b>A1. Produce user interface assets and visual styles for interactive media product/service (IMP/S)</b>
Description	<p>The ability to prepare interface design for technical implementation.</p> <p>The ability to use style-sheets (e.g. CSS, XSL) to create web pages.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Dreamweaver</i></li> <li>• <i>Microsoft FrontPage</i></li> <li>• <i>Adobe ImageReady</i></li> <li>• <i>Adobe Fireworks</i></li> <li>• <i>Equilibrium DeBabelizer</i></li> <li>• <i>Terran Interactive Media Cleaner</i></li> </ul>
Examples of job titles	Computer Graphic Artist, Assistant Producer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Slice a visual design to create component assets (e.g. buttons) in a manner that makes technical implementation as simple as possible;</li> <li>• Follow instructions provided by the interface designer;</li> <li>• Source additional assets, such as sound effects, as appropriate to the designer's instructions;</li> <li>• Select or create appropriate colour palettes for graphical interface assets;</li> </ul>

	<ul style="list-style-type: none"> <li>• Test and debug your style sheets;</li> <li>• Document style-sheets so they can be understood by others;</li> <li>• Respond positively to requests for changes.</li> <li>• Optimise slicing and preparing interface components to contribute to the smooth and fast operation of the finished user interface;</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Create all the required component assets (e.g. for different button states);</li> <li>• Create style-sheets that comply with relevant standards, guidelines or conventions;</li> <li>• Produce well-formed, robust, accurate and efficient style-sheets.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding of project parameters and constraints including target platforms and their capabilities;</li> <li>• Knowledge of industry-standard software tools and development environments;</li> <li>• Knowledge of sources of information for help, tips and tricks, e.g. for making most effective use of CSS;</li> <li>• Understanding how the assets, style sheets will be used in the finished product;</li> <li>• Understanding when rights clearances are needed to obtain and use assets;</li> <li>• Understanding of the file formats that can be supported by the target platform and/or intended authoring tool;</li> <li>• Knowledge of naming conventions, standards, guidelines or specifications;</li> <li>• Knowledge of usability and accessibility issues relating to graphical or audio interface components;</li> <li>• Knowledge of web pages to which style-sheets will be applied;</li> <li>• Knowledge of the implications of later requests for changes to the product;</li> </ul>



	<ul style="list-style-type: none"> <li>• Understanding the requirements and expectations of those who may be involved in debugging, using or modifying assets and style-sheets;</li> <li>• Knowledge of CSS syntax;</li> <li>• Knowledge of W3C web standards and accessibility guidelines; Understanding the effect of image colour-depth, resolution and dimensions on file-size;</li> <li>• Understanding the effect of audio, video and animation in the context of interface design.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow specifications or other briefs;</li> <li>• Ability to find relevant sources of additional assets, such as style galleries etc.</li> <li>• Ability to liaise with others to ensure you obtain the assets you need at the right time and in appropriate formats;</li> <li>• Ability to use digital image manipulation tools;</li> <li>• Ability to analyse mark-up to determine the page structure and identify the elements you need to provide for in your style-sheets;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to produce style-sheets that are easy to debug and maintain;</li> <li>• Ability to clearly document style-sheets;</li> <li>• Ability to test and debug your style-sheets efficiently, especially for cross-browser compatibility.</li> </ul>

Competency	<b>A2. Produce 2D &amp; 3D animations for interactive media product/service (IMP/S)</b>
Description	<p>The ability to create two and three dimensional objects and environments for animations as part of an interactive media product.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Flash</i></li> <li>• <i>Alias Wavefront</i></li> <li>• <i>Alias Maya</i></li> <li>• <i>Discreet 3D Studio Max</i></li> <li>• <i>Discreet 3D Studio</i></li> <li>• <i>Soft Image XSI</i></li> </ul>
Examples of job titles	Animator, Flash Developer, Interface Designer, Modeller, Artist, Texture Artist
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Design animations within specified style guidelines;</li> <li>• Design animations within specified parameters and constraints relating to the target platform and medium;</li> <li>• Create animations that are attractive, easy to use and fit for purpose;</li> <li>• Liaise with the relevant authority to obtain approval for your animations;</li> <li>• Save animations in appropriate formats so that they can be easily incorporated into the product;</li> <li>• Provide clear documentation as necessary for others to</li> </ul>

	<p>incorporate your animations into the product;</p> <ul style="list-style-type: none"> <li>• Organise animations using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>• Liaise with colleagues, such as designers and developers, to ensure your animations are appropriate and meet requirements.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Animated interface components (such as buttons);</li> <li>• Animated transitions between interfaces;</li> <li>• Objects that animate or move in response to user interaction (such as expanding menus).</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of the relevant standards and conventions relating to user-interface design;</li> <li>• Knowledge of the principles of traditional and computer animation;</li> <li>• Knowledge of 2D and 3D modelling and animation;</li> <li>• Knowledge of the principles of interaction design, especially regarding usability and accessibility;</li> <li>• Understanding the impact of technical parameters such as the target device's processing power, memory, bandwidth, screen size, resolution, colour depth, input device etc.,</li> <li>• Knowledge of the product's purpose and target users;</li> <li>• Knowledge of the expectations and requirements of target users;</li> <li>• Knowledge of the events or user interactions that will trigger your animations;</li> <li>• Understanding of the creative style and overall concept of the product in which texture models will be used;</li> <li>• Understanding of how animation will be used in the product (for example, whether it will play once, loop several times or indefinitely etc.);</li> <li>• Knowledge of naming conventions, standards, guidelines or specifications that you need to follow;</li> <li>• Knowledge of the technical processes that will be used in the finished product;</li> </ul>

	<ul style="list-style-type: none"> <li>• Understanding the different types of rendering effects that can be applied to animation objects and environments;</li> <li>• Knowledge of the effects of camera positions and angles, lighting and reflection on the appearance of animation objects and environments;</li> <li>• Understanding the implications for animation of the interactive environment and the non-linear nature of IMP/S (e.g. the need to plan for points of view or movements you may not have anticipated).</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow specifications or other briefs;</li> <li>• Ability to use appropriate modelling and animation software;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to clearly document animations so that others can use them easily (for example, so that developers can code scripts to access specific frames or scenes);</li> <li>• Ability to supply textures to supplied wire-frame models to test the integrity of rendered objects or environments to ensure they appear correctly from all required positions and angles;</li> <li>• Ability to ensure that the animations provided can be rendered at the required speed and quality within the capabilities of the target platform;</li> <li>• Ability to portray realistic movements that are appropriate to the type of object being modelled and the style of animation required;</li> <li>• Ability to test the integrity of wire-frame models to ensure they appear correctly from all required camera positions and angles;</li> <li>• Ability to create prototype animations as necessary to check the integrity of the movement;</li> <li>• Ability to supply animation assets in an appropriate format;</li> <li>• Ability to organise animation assets using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>• Ability to liaise with colleagues as appropriate to test animation assets and ensure they are appropriate and meet requirements.</li> </ul>

Competency	<b>A3. Produce the music and sound effects for interactive media product/service</b> <b>(IMP/S)</b>
Description	<p>The ability to create sound effects, compose and record music that work in an interactive context.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Sound forge</i></li> <li>• <i>WaveLab</i></li> <li>• <i>Peak</i></li> <li>• <i>CoolEdit</i></li> <li>• <i>ProTools</i></li> <li>• <i>Nuendo</i></li> <li>• <i>Logic Audio</i></li> <li>• <i>Cubase</i></li> <li>• <i>ProTools</i></li> <li>• <i>Nuendo</i></li> <li>• <i>Gigastudio</i></li> </ul>
Examples of job titles	Audio Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Edit existing audio material to create sound effects to meet a brief or specification;</li> <li>• Compose music that is appropriate for the purpose and mood of the product;</li> <li>• Systematically assess the implementation of work in iterative versions and specify changes in effects, volume, pitch and panning;</li> <li>• Liaise with the relevant authority to obtain approval for sound effects and music;</li> </ul>

	<ul style="list-style-type: none"> <li>Record music in an appropriate format that can be reproduced within the capabilities of the target platforms;</li> <li>Provide clear documentation and audio demonstration clips as necessary for others to incorporate sound effects and music into the product;</li> <li>Organise sound effects and music using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>Liaise with colleagues, such as designers and developers, to ensure sound effects and music are appropriate and meet requirements.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>Generate original sound effects to meet a brief or specification;</li> <li>Create music that can respond to events and user interactions as required.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>Knowledge of the principles sound design, sound effects and acoustics;</li> <li>Understanding effect of audio sampling-rates and bit-depth on file-size and data-transfer rates;</li> <li>Knowledge of when and why a sound effect might be cut-off prematurely, and how to minimise the risk of this adversely affecting the product;</li> <li>Knowledge of the various types of data compression and their relative merits and demerits;</li> <li>Knowledge of different formats in which music can be output, and when it would be appropriate to use them;</li> <li>Knowledge of events or user interactions that will trigger sound effects in the product;</li> <li>Understanding of how sound effect and/or will be used in the product (for example, whether it will play once, loop several times or indefinitely etc.);</li> <li>Understanding what is required for the music to change in response to events or user interactions (for example by changing key or tempo, or by segueing into another piece);</li> <li>Knowledge of compatibility issues between mono, stereo, multi-channel and surround sound;</li> <li>Understanding when permission is needed to use material</li> </ul>

	<p>created by others;</p> <ul style="list-style-type: none"> <li>• Understanding the limits of what can be legally done with material created by others before permission is needed;</li> <li>• Knowledge of relevant naming conventions, standards, guidelines or specifications</li> <li>• Understanding requirements and expectations of other team members who will use the sound effects created;</li> <li>• Knowledge of the different technologies used in a computer-based music studio, including samplers, sequencers, MIDI devices, 'outboard' recording studio hardware and mixing desks.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow specifications or other briefs;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to locate sources of audio material suitable for meeting the creative brief;</li> <li>• Knowledge of the types of audio effects that are available and their suitability for different products and contexts;</li> <li>• Ability to use sound effects to enhance the user's experience and/or give feedback on user interactions;</li> <li>• Knowledge of the appropriate file formats for saving sound effects;</li> <li>• Ability to layer sounds to achieve a combined audio effect or to produce a complex replay of elements with logical replay rules;</li> <li>• Ability to use various techniques for synchronising sounds to moving images;</li> <li>• Ability to record, edit and implement post production of dialogue;</li> <li>• Ability to assess and specify music requirements as necessary;</li> <li>• Ability to sample audio from legitimate sources and use sound samples in your composition;</li> <li>• Ability to use appropriate software to record, sequence and mix audio;</li> <li>• Ability to address the challenges of scoring music for non-linear medium with scenes of indeterminate length by employing techniques like branching segments and the use of music layers mixed dynamically at run-time.</li> </ul>

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Competency	<b>A4. Produce video for interactive media product/service (IMP/S)</b>
Description	<p>The ability to produce and stream video in an interactive context, with a focus on video post-production, effects and compositing.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe AfterEffects</i></li> <li>• <i>Adobe Premier</i></li> <li>• <i>Avid</i></li> <li>• <i>Flash Media Server</i></li> <li>• <i>FinalCut</i></li> </ul>
Examples of job titles	Digital Video Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Correctly prepare video files for post-production and compositing;</li> <li>• Set time code to meet post production requirements;</li> <li>• Synchronise time code with other sources, or provide a master reference;</li> <li>• Clearly mark the video media files for identification.</li> </ul> <p>Criteria regarding product</p>

	<ul style="list-style-type: none"> <li>• Generate composited video to meet a brief or specification;</li> <li>• Create video that can respond to events and user interactions as required;</li> <li>• Create video streaming appropriate to the requirements of the IMP/S.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of the principles video design, post-production and streaming;</li> <li>• Understanding effect of video sampling-rates and bit-depth on file-size and data-transfer rates;</li> <li>• Knowledge of different formats, codecs, compression and streaming methods in which video can be output, and when it would be appropriate to use them;</li> <li>• Knowledge of events or user interactions that will trigger video effects in the product;</li> <li>• Understanding when permission is needed to use material created by others;</li> <li>• Knowledge of the different technologies used in a computer-based video studio, including post-production, compositing and streaming applications;</li> <li>• Knowledge of post production requirements for correct time codes;</li> <li>• Knowledge of the differences in cost and functionality between true streaming (using a streaming server) and progressive download;</li> <li>• Knowledge of the streaming media object model including the connection, session and stream objects.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to locate sources of video material suitable for meeting the creative brief;</li> <li>• Ability to use video effects and compositing techniques as appropriate for different products and contexts;</li> <li>• Ability to use video effects to enhance the user's experience and/or give feedback on user interactions;</li> </ul>

	<ul style="list-style-type: none"><li>• Ability to use various techniques for synchronising images with sound or dialogue;</li><li>• Ability to assess and specify video requirements as necessary;</li><li>• Ability to sample video from legitimate sources and use samples in the composition;</li><li>• Ability to use appropriate editing , compositing and streaming applications;</li><li>• Ability to provide safe storage for the video files;</li><li>• Ability to create streaming video applications using streaming servers or progressive download.</li></ul>
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Table 1 Production Pipeline for the Art & Technology of New Generation Entertainment program

Role ► Phase ▼	Concept Development	Technology	Art (Visual Design)	Management & Quality Assurance	Commercial interface
<b>STRATEGY</b>					
<b>Define IMP/S</b>	C1. Provide creative and strategic direction for projects				C8. Business & Management
<b>CREATION &amp; DEVELOPMENT</b>					<ul style="list-style-type: none"> <li>• Manage business processes</li> <li>• Build organisation's understanding of its market and customers</li> <li>• <u>Develop and implement marketing plans</u></li> </ul>
<b>Design, create, develop and manage IMP/S</b>	C2. Create the functional design of the IMP/S  C3. Create the visual design of the IMP/S  C4. Create the content design of the IMP/S			<b>C5. Project Management</b> <ul style="list-style-type: none"> <li>• Manage resources and assess risks required for the production</li> <li>• Prepare budget plans for the production</li> <li>• Plan and schedule the production for IMP/S</li> <li>• Track and manage IMP/S progress</li> </ul>	
<b>PRODUCTION</b>				C6. Quality Assurance	

Manage and plan the production of IMP/S		<p>T1. Contribute to the implementation of functional and technical design of IMP/S</p> <p>T2. Implement functionality of IMP/S</p> <ul style="list-style-type: none"> <li>Consideration of authoring tools to create IMP/S</li> <li>Code scripts and mark ups to develop functionality</li> <li>Program web based electronic games to develop functionality</li> <li>Data analysis and data structure design</li> </ul>	<p>A1. Produce user face assets and style sheets for IMP/S</p> <p>A2. Produce 2D&amp;3D animations for IMP/S</p> <p>A3. Produce sound and music effects for IMP/S</p> <p>A4. Produce video effects for IMP/S</p>	<ul style="list-style-type: none"> <li>Devise, conduct and evaluate testing of IMP/S</li> </ul> <p>C7. Managing self &amp; others</p> <ul style="list-style-type: none"> <li>Create effective working relationships</li> <li>Master appropriate interpersonal, oral and written communication (English)</li> <li>Develop leadership</li> <li>Knowledge updating</li> </ul>	
	SUPPORT				

Table 2 Role descriptions placed within production pipeline, Skillset (2005) & CompTrain (2007)

Role ► Phase ▼	Concept Development	Technology	Art (Visual Design)	Management/Business/ Quality Assurance
<b>CREATION &amp; DEVELOPMENT</b>  <b>Target:</b> stakeholders  IMP/S-Interactive Media Product/Service	<b>Designer</b> -creates the 'look and feel' of an IMP/S.  <b>User Experience Designer</b>  <b>Game Designer</b>  <b>Web Designer</b>  <b>Visual Designer</b>  <b>Media Specialist</b> <b>Content strategist</b> - scopes and plans IMP/S content and determine its overall style.  10.1.1.3 <i>Developer- creates an IMP/S</i>  <b>Web Content Developer</b>  <b>Scriptwriter</b>  <b>Storyline Author</b>	<b>Technical Director</b>  <b>Technical Lead</b>  <b>Webmaster</b>  <b>Cross Media Specialist</b>          <b>Game Developer</b>  <b>Web Developer</b>	<b>Web writer/Copy writer/Copy Editor</b> - creates text content for web sites, usually as part of the site development, though they may also be involved with on-going publishing after launch. This is primarily a journalistic role.          <b>User Experience Designer</b>	<ul style="list-style-type: none"> <li>• <b>Producer/Project Director</b>- is a senior, client-facing role that requires expertise in business, management, content, design and technical disciplines.</li> <li>• 10.1.1.2 <i>Production Assistant- contributes to the production of IMP/S by assisting the project team.</i></li> </ul> <b>Project manager</b> - plans, schedules and co-ordinates interactive media development projects, ensuring they run smoothly, on time and within budget.  <b>Studio manager</b> - ensures the studio has adequate resources to carry out its work and, conversely, that the work it takes on is realistic and manageable within the available resources.  <b>Account manager</b> -develops, maintains and improves relationships with existing clients, ensuring their needs are met, and obtaining repeat

<p><b>PRODUCTION</b></p> <p><b>Target:</b> the customer &amp; user</p> <p>IMP/S-Interactive Media Product/Service</p>	<ul style="list-style-type: none"> <li><b>Producer/Project Director-</b> is a senior, client-facing role that requires expertise in business, management, content, design and technical disciplines.</li> <li><b>10.1.1.4 Production Assistant –</b> <i>contributes to the production of IMP/S by assisting the project team.</i></li> </ul>	<p><b>Technical Architect</b></p> <p><b>Server Administrator</b></p> <p><b>Database Specialist</b></p> <p><b>Programmer-</b>produces computer software in order to give a product its functionality.</p> <p><b>Flash Programmer</b></p> <p><b>Search Engine Optimisation (SEO) Specialist-</b>optimises a web site or pages to make them as visible as possible to Internet search engines, in order to maximise traffic to them.</p> <p><b>Tester</b></p>	<p><b>Web editor-</b>plans and oversees the on-going management of a web site and the publication of content to it.</p> <p><b>Technical Artist</b></p> <p><b>Computer Graphic Designer</b></p> <p><b>3D Specialist</b></p> <p><b>Animator</b></p> <p><b>Flash Developer</b></p> <p><b>Interface Designer</b></p> <p><b>Modeller</b></p> <p><b>Texture Artist</b></p> <p><b>Audio Designer</b></p> <p><b>Digital Video Designer</b></p>	<p>business from them.</p> <p><b>New business developer-</b> often only identifies prospective clients and then hand over leads to a senior role such as an Account Manager. May additionally be responsible for winning the business by developing proposals and making pitches.</p> <p><b>Web marketing Specialist</b></p> <p><b>Quality Assurance Manager</b></p> <p><b>Tester</b></p>
<p><b>SUPPORT</b></p>	<ul style="list-style-type: none"> <li></li> </ul>	<p><b>SEO Specialist</b></p> <p><b>Forum moderator</b></p> <p><b>Internet Librarian</b></p>		<p><b>Usability specialist-</b> ensures an IMP/S meets the needs of its intended audiences</p>

## CORE COMPETENCIES

Competency	<b>C1. Provide creative and strategic direction for interactive media projects</b>
Description	<p>Ability to understand and specify the product's commercial requirements and/or purpose.</p> <p>These roles require expertise in business, management, content, design and technical disciplines and have a close relationship with project management. However this function focuses on the project's creative requirements rather than the mechanics of running it. In reality, the two functions are often combined.</p>
Examples of job titles	Producer, Project Director
Criteria regarding product and process (also referred to as indicators)	<p>Criteria in regards to process</p> <ul style="list-style-type: none"> <li>• Collaborate with the project sponsors to: <ul style="list-style-type: none"> <li>- Identify existing design solutions which meets the parameters of the brief and select possible adaptations which will contribute to design ideas for further consideration;</li> <li>- Evaluate potential design adaptations against significant parameters of the design brief;</li> <li>- Discard options which fail to meet design parameters and identify alternatives which offer significant advantages over discarded options;</li> <li>- If it is not possible to produce one solution that meets all requirements of the brief, assess realistic changes to the design brief and make recommendations;</li> <li>- Assess realistically the implication of modifying the design brief and record the outcomes;</li> </ul> </li> <li>• Combine creative, logical and analytical thinking;</li> <li>• Contribute to project teams and specialists;</li> <li>• Ensure the project's business objectives and creative vision are clearly defined and met.</li> </ul> <p>Criteria in regards to product</p> <ul style="list-style-type: none"> <li>• Originate conceptual ideas, usually in consultation with others;</li> <li>• Produce written or drawn design documentation to produce a fit for purpose product or service in line with initial specifications required by the decision makers and the targeted market.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding of market developments, new technologies, techniques and best practice;</li> <li>• Understanding of the different technologies, tools, formats, and creative or technical approaches that are available and their advantages, disadvantages and implications;</li> <li>• Understanding the nature, constraints, opportunities and parameters of the platforms technologies and media;</li> <li>• Understanding of common problems, design changes and contingencies that may occur in a project and how to manage their impact;</li> <li>• Knowledge of different sources of existing design options;</li> <li>• Knowledge of different types of evaluation for testing existing design solutions;</li> <li>• Understanding the needs and expectations of the organisation's design and production staff;</li> <li>• Understanding of the different specialist skills that may be required for a given project ;</li> <li>• Understanding the nature of the client's business and the context in which the product is required;</li> <li>• Understanding of the inter-relations between content, design and technology;</li> <li>• Understanding the importance of sound project management processes, including the need to obtain approval for one key stage before proceeding to the next.</li> </ul>



Skills	<ul style="list-style-type: none"><li>• Ability to identify and select which technologies, tools, and creative or technical approaches would be most appropriate to use;</li><li>• Ability to use text and diagrams or drawings to create clear and accurate specification documents from which the product can be designed;</li><li>• Ability to explain technical or specialist issues or work to non-technical people or to specialists in other areas;</li><li>• Ability to seek and respond constructively to advice or feed back from decision makers concerning the quality, fitness for purpose, or any other aspect of the project;</li><li>• Conduct discussions and negotiations in a way that promotes co-operation and goodwill;</li><li>• Devise and implement contingency plans for reasonably foreseeable setbacks that might affect the ability to deliver work on time.</li></ul>
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Competency	<b>C2. Create the functional design of interactive media product/service (IMP/S)</b>
Description	<p>The ability to design the overall product concept and functionality, and specify this through appropriate documentation.</p> <p>Interpretation of high-level requirements in order to devise an appropriate solution, including, user experience, interface specification and enabling technologies.</p>
Examples of job titles	Technical Lead, Technical Director, User Experience Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Combine creative, logical and analytical thinking;</li> <li>• Use of a range of relevant enabling technologies to demonstrate functionality;</li> <li>• Devise end-user features such as navigational or functional devices;</li> <li>• Prepare design briefs or give instructions to technical developers;</li> <li>• Devise and document game rules (electronic games);</li> <li>• Specify the characteristics of the game world i.e. attributes and behaviours of objects and characters in sufficient detail for realisation by others (electronic games).</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Produce functioning prototypes;</li> <li>• Produce document of technical specifications;</li> <li>• Present a game design that is fun and playable (electronic games).</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding of the different creative and technical approaches that are available;</li> <li>• Knowledge of the relevant technologies and their capabilities;</li> <li>• Understanding the nature of the client's business and the context in which the product is required;</li> <li>• Understanding of the target audience and their expectations and preferences;</li> <li>• Understanding the impact on the product/service design of technical parameters such as the target device's processing power, memory, bandwidth, screen size, resolution, colour depth, input device etc.;</li> <li>• Knowledge of relevant standards, conventions and guidelines;</li> <li>• Understanding of requirements for localisation, and the impact of these on the product architecture.</li> <li>• Knowledge of the relevant principles and methodology of software engineering;</li> <li>• Knowledge of theories of game design (electronic games);</li> <li>• Knowledge of different genres of game and the types of audience they appeal to (electronic games)</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to obtain and analyse product information to determine relevant design parameters;</li> <li>• Ability to specify functionality and decide how end-user features should operate;</li> <li>• Ability to develop user personas, usage scenarios and user journeys;</li> <li>• Ability to design content structures, navigational devices and interface functions that are appropriate to the target users and product purpose;</li> <li>• Ability to devise appropriate naming, coding or mapping conventions for documenting the product structure;</li> <li>• Ability to select and specify features that will assist usability, navigation and location of content;</li> <li>• Ability to liaise with colleagues to ensure the product design and user interface</li> </ul>

	<p>are suitable for the product's intended purpose and audience;</p> <ul style="list-style-type: none"><li>• Document specifications and designs in appropriate formats and in sufficient detail to serve as a blueprint for the product development i.e. using text, drawings, wire-frames, storyboards, maps or diagrams.</li></ul>
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Competency	<b>C3. Create the visual design of interactive media product/service (IMP/S)</b>
Description	<p>Ability to design the “look and feel” of the user interface for a product, ensure that all the required visual assets are created and available in the right format and prepare for its technical implementation.</p> <p>Some examples of industry-standard software used:</p> <ul style="list-style-type: none"> <li>• <i>Adobe ImageReady</i></li> <li>• <i>Adobe Fireworks</i></li> <li>• <i>Equilibrium DeBabelizer</i></li> <li>• <i>Terran Interactive Media Cleaner</i></li> <li>• <i>Adobe Photoshop</i></li> <li>• <i>Adobe Illustrator</i></li> <li>• <i>Adobe Freehand</i></li> <li>• <i>Flash</i></li> </ul>
Examples of job titles	Web Designer, Interface Designer, Interaction Designer, Production Assistant, Web Developer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Design static and animated visual components;</li> <li>• Specify how elements should respond to user interaction.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• The required component assets are created and available in the right format;</li> <li>• Visuals for user interfaces and/ or environments are produced;</li> <li>• Designs conform to good visual design principles.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding the product’s purpose and target users;</li> <li>• Understanding the expectations and requirements of target users;</li> <li>• Knowledge of the constraints and parameters within the design including target platforms and their capabilities for delivering assets;</li> <li>• Knowledge of relevant standards and conventions relating to user-interface design and industry-standard software tools;</li> <li>• Knowledge of colour theory i.e. the effect of image colour-depth, resolution and dimensions on file-size;</li> <li>• Understanding of usability and accessibility issues relating to graphical or audio interface components;</li> <li>• Knowledge of the principles of typography;</li> <li>• Knowledge of the relevant sources of additional assets, such as sound libraries etc. When rights clearances are needed to use assets;</li> <li>• Knowledge of visual design theory – principles and elements of visual design.</li> <li>• Knowledge of good visual communication vocabulary;</li> <li>• Knowledge of the role of storyboards and concept art to communicate visual ideas.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow a design brief or other instructions;</li> <li>• Ability to design within specified parameters and constraints relating to the target platform and medium;</li> <li>• Ability to design end user features to facilitate the use of interactive products;</li> <li>• Ability to select and agree the visual style and interactive character of products;</li> <li>• Ability to design interfaces or environments that are attractive, easy to use and fit for purpose;</li> <li>• Ability to liaise with colleagues to ensure the designs can be implemented within the available resources and project parameters;</li> <li>• Ability to deliver designs in appropriate formats so that they can be easily implemented;</li> </ul>

	<ul style="list-style-type: none"> <li>• Ability to specify where and when additional assets, such as sounds and animations should be incorporated into the interface;</li> <li>• Ability to provide documentation or instructions as required to ensure that others have the necessary information to implement the design properly;</li> <li>• Ability to use digital image manipulation tools;</li> <li>• Ability to use digital video and audio editing tools;</li> <li>• Ability to achieve appropriate file-sizes and efficient data-transfer rates while maintaining asset quality;</li> <li>• Ability to select or create appropriate colour palettes for graphical interface assets;</li> <li>• Ability to draw on visual design elements principles to create good visual design;</li> <li>• Ability to communicate visual ideas verbally;</li> <li>• Ability to communicate visual ideas with storyboards, thumb-nails and concept art.</li> </ul>
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<b>Competency</b>	<b>C4. Create the content design of interactive media product/service (IMP/S)</b>
<b>Description</b>	<p>The ability to plan, write and/or edit the content of an interactive media product. This could range from short user instructions to entire web pages.</p> <p>At times, in collaboration with Producer, or responding to their specifications, a brief or guidance for copywriters, editors, illustrators, animators etc are provided. At times, there is a requirement to liaise with intellectual property specialists to obtain rights to use material owned by others.</p>
<b>Examples of job titles</b>	Content Strategist, Content Director, Webmaster, Copywriter, Copy Editor
<b>Criteria regarding product and process (also referred to as indicators)</b>	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Identifying key messages, themes, tone and personality for written content;</li> <li>• Specifying visual or other assets</li> <li>• Developing house styles and publishing guidelines.</li> <li>• Determine the content and style of text-based content;</li> <li>• Be responsible for the overall direction and quality of the text-based content.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Create and develop content in response to a detailed or sketchy brief, or write up an original idea.</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Knowledge of different styles of writing and their suitability for different audiences and communication objectives;</li> <li>• A wide knowledge of cultural, historical, popular and literary influences which can be used to enhance and amplify the message;</li> <li>• Knowledge of relevant theories and principles of Media, Communication, Cognitive and Narrative theories;</li> <li>• Understanding of the characteristics and appeal of different genres of story telling;</li> <li>• Knowledge of any relevant conventions, style guides or policies that you need to follow;</li> <li>• Understanding of usability issues and relevant accessibility standards and guidelines;</li> <li>• Knowledge of any requirements for localisation, and the impact of these on the product content;</li> <li>• Understanding of content management systems;</li> </ul>

	<ul style="list-style-type: none"> <li>• Understanding of organisational processes, resource issues, or other factors that may affect the project sponsor's on-going ability to create, update and manage content;</li> <li>• Knowledge of the legal and contractual implications of using material in which others hold intellectual property rights;</li> <li>• Knowledge of relevant legislation concerning intellectual property, copyright, libel and obscenity.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to obtain and analyse product information to identify messages and themes for the content;</li> <li>• Ability to devise appropriate writing styles;</li> <li>• Ability to use instructional text to enhance the product's usability, and when it may be needed;</li> <li>• Ability to make creative connections from a wide range of cultural, historical popular and literary influences to enhance the effectiveness of the text;</li> <li>• Ability to check the reliability and currency of any information sources you use;</li> <li>• Ability to write text that takes account of search-engine optimisation techniques while remaining attractive and readable for humans;</li> <li>• Ability to develop and document guidance, styles and policies for writers and other content contributors that are clear, realistic, relevant and easy to access;</li> <li>• Ability to write in a consistent style suitable for the target audience and the purpose of the communication;</li> <li>• Ability to structure the text-based content so that it is easy to read and navigate;</li> <li>• Ability to follow relevant writing conventions, style guides and policies;</li> <li>• Ability to proof-read copy to check for spelling, grammatical, typographic or other errors;</li> <li>• Ability to check that any facts and figures that are quoted are accurate;</li> <li>• Ability to comply with relevant legislation.</li> </ul>

Competency	<b>C5. Project Management for the creation, development and production of interactive media product/service (IMP/S)</b>
Description	The ability to contribute to translating the basic design documentation into a plan and schedule for production and work effectively with the designated leader to execute the process.
Examples of job titles	Project Manager, Studio Manager
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Address multiple demands without losing focus or energy.</li> <li>• Recognise changes in circumstances promptly and adjust plans and activities accordingly.</li> <li>• Find practical ways to overcome barriers.</li> <li>• Keep the team informed of plans and developments.</li> <li>• Present information clearly, concisely, accurately and in ways that promote understanding.</li> <li>• Monitor the quality of work and progress against plans and take appropriate corrective action, where necessary.</li> <li>• Create a sense of common purpose</li> <li>• Ensure that the team manages their tasks to meet the requirements of the project.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Ensure the schedule is achievable within budget and stipulated time frame.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of agreed key objectives and scope of the project and the available resources;</li> <li>• Understanding of the overall organizational, vision, objectives, plans, policies, practices and activities that may affect the project and any other project currently operating;</li> <li>• Understanding the roles and key responsibilities of all team members;</li> <li>• Knowledge of the principles, processes, tools and techniques for managing projects commonly used in the industry;</li> <li>• Knowledge and oversight of production processes;</li> <li>• Understanding of people-management skills such as teambuilding, motivation, facilitation of problem solving and communication;</li> <li>• Understanding of the basic principles, methods and techniques of total quality management including knowledge of the appropriate financial tracking tools;</li> <li>• Understanding risks and contingencies common to the industry/sector;</li> <li>• Knowledge of sector relevant ISO standards legislation, regulations, guidelines, best practices and codes of practice ;</li> <li>• Understanding of required documentation.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to analyse, breakdown and implement the design brief into its components;</li> <li>• Ability to develop a project schedule for team members;</li> <li>• Ability to analyse and balance the different forces acting on the development project;</li> <li>• Ability to analyse and refine working practices;</li> <li>• Ability to manage, motivate, plan, monitor, and assess people through knowledge, ideas and new approaches;</li> <li>• Ability to assess and manage risk;</li> </ul>

	<ul style="list-style-type: none"><li>• Ability to manage change within projects;</li><li>• Ability to monitor the project so that it achieves the stated objectives in the most effective and efficient way, on time and within the budget;</li><li>• Ability to provide support to allow the project team to perform efficiently and effectively;</li><li>• Ability to integrate quality processes and use the feedback to implement further improvements.</li></ul>
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Competency	<b>C6. Quality Assurance of interactive media product/service (IMP/S) in all stages of the production pipeline.</b>
Description	<p>In all stages of development IMP/s will need to conform to various International, Industry and in-house standards. Ability to make recommendations about how the product might need to be changed as a result of the quality testing.</p> <p>The following abilities are crucial elements of the iterative process. Designing , conducting and evaluating user tests to ensure a product or product design is:</p> <ol style="list-style-type: none"> <li>7. Fit for its intended purpose;</li> <li>8. Usable by its intended users;</li> <li>9. Of sufficient quality.</li> </ol>
Examples of job titles	Tester, Quality Assurance Manager
Criteria regarding product and process (also referred to as indicators)	<p>10.1.1.4.1.1 Criteria regarding the process</p> <ul style="list-style-type: none"> <li>• Ensure that all development processes conform to relevant standards;</li> <li>• Design, conduct and evaluate a test procedure;</li> <li>• Select and recruit test observers/facilitators where appropriate, and ensure they are properly briefed about the objectives of the test and its assessment criteria;</li> <li>• Track and rectify errors and implement improvements based on feedback produced by the test procedure;</li> <li>• Document activities and tasks accurately and in an appropriate format;</li> <li>• Recommend design changes arising from the test results to the appropriate party.</li> </ul> <p>10.1.1.4.1.2 Criteria regarding the product</p> <ul style="list-style-type: none"> <li>• A product or service that is compliant with all relevant standards;</li> <li>• A systematic and effective bug-tracking database;</li> <li>• An efficient, optimized and effective IMP/S.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of sector relevant ISO standards, W3C Web standards, legislation, regulations, guidelines, best practices and codes of practice. These will include standards for usability, accessibility and other W3C web standards;</li> <li>• Knowledge of relevant theoretical domains such as Human-Computer Interaction (HCI), Engagement/Immersion, Communication and Media theory etc.;</li> <li>• Knowledge of the needs of the target group;</li> <li>• Knowledge of the product throughout its development cycle;</li> <li>• Understanding of the tracking process and documentation of various aspects of the project throughout the QA test cycle (reports, updates, resources, budgets, etc);</li> <li>• Knowledge of test strategies procedures and where to source testing resources;</li> </ul> <p>Knowledge of suitable qualitative and quantitative procedures and processes to evaluate testing processes.</p>
Skills	<ul style="list-style-type: none"> <li>• Ability to accurately interpret relevant standards documentation;</li> <li>• Ability to implement relevant international, industry and in-house standards effectively;</li> <li>• Ability to select testing methods capable of generating valid data about the overall product design;</li> <li>• Ability to plan, organise and schedule the testing cycles;</li> <li>• Ability to recognise, track, organise and manage bugs;</li> <li>• Ability to analyse qualitative and quantitative data;</li> <li>• Ability to liaise diplomatically with relevant colleagues, in particular designers and developers, to negotiate changes to the design or implementation;</li> <li>• Ability to evaluate testing process and implement improvements based on test feedback.</li> </ul>

Competency	<b>C7. Managing self &amp; others</b>
Description	Ability to manage self effectively and develop productive working relationships with internal and external parties. Ability to understand the relevant industry, corporate, technological, and creative domains and ability to continuously update skills and knowledge in these domains.
Examples of job titles	Not applicable
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Conduct discussions and negotiations in a way that promotes co-operation and goodwill;</li> <li>• Seek and respond constructively to advice or feed back from appropriate people concerning the quality, fitness for purpose, or any other aspect of, your work;</li> <li>• Comply with legal requirements, industry regulations, organisational policies and professional codes;</li> <li>• Contribute to an atmosphere of professionalism and mutual support;</li> <li>• Present information clearly, concisely, accurately and in ways that promote understanding;</li> <li>• Take personal responsibility for making things happen;</li> <li>• Able to take decisions autonomously while acting within the limits of given authority;</li> <li>• Demonstrate integrity, fairness and consistency in decision-making;</li> <li>• Understand people's needs and modelling behaviour that shows respect, helpfulness and co-operation;</li> <li>• Manage continuing professional development;</li> <li>• Maintain up-to-date awareness of industry developments, new technologies, techniques and best practice.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding principles of effective communication and how to apply them in order to communicate effectively with colleagues and stakeholders.</li> <li>• Understand and take account of the priorities, expectations and authority of colleagues and stakeholders in decisions and actions.</li> <li>• Knowledge of the relevant regulations, standards and codes of practice, behaviour and performance.</li> <li>• Knowledge of different genres of written communication for specific audiences i.e. formatting and styles;</li> <li>• Knowledge of the principles and practices of effective interpersonal communication;</li> <li>• Knowledge of the English language</li> <li>• Understanding of cross cultural issues in communication;</li> <li>• Knowledge that different styles of management exist;</li> <li>• Knowledge of difficulties and challenges that may arise, including conflict, diversity and inclusion issues within the team, and ways of identifying and overcoming them;</li> <li>• Knowledge of appropriate resources to update skills and knowledge such as newsgroups, mailing lists, web sites, seminars, courses, networking opportunities etc.;</li> <li>• Knowledge of research methods and techniques.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to identify your organisation's stakeholders including background information and the nature of their interest in your organisation;</li> <li>• Ability to present ideas to colleagues and gain their support;</li> <li>• Ability to establish working relationships with all colleagues;</li> <li>• Ability to recognise, agree and respect the roles and responsibilities of colleagues;</li> <li>• Ability to communicate and listen effectively and take into account individual and cultural differences;</li> <li>• Ability to contribute to encouraging and supporting team members to achieve their personal work objectives and those of the team and provide recognition when objectives have been achieved or when there have been setbacks or change;</li> <li>• Ability to identify and sort out conflicts of interest and disagreements with colleagues in ways that minimise damage to work being carried out;</li> </ul>

	<ul style="list-style-type: none"> <li>• Ability to give and receive frank and constructive feedback;</li> <li>• Ability to respond constructively to feedback, whether negative or positive;</li> <li>• Ability to encourage and recognise creativity and innovation within the team;</li> <li>• Ability to write for different audiences;</li> <li>• Ability to use written business and technical terminology accurately and effectively using the appropriate format and style in English;</li> <li>• Ability to structure written material appropriately;</li> <li>• Ability to adapt style of interpersonal communication e.g. intonation, inflexion, business or technical terminology and vocabulary, to suit audience needs;</li> <li>• Ability to effectively facilitate personal and professional development.</li> </ul>
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<b>Competency</b>	<b>C8. Business and Management</b>
<b>Description</b>	The ability to manage business processes to ensure that organisation delivers outputs that meet customers and stakeholders' needs, and organisational and legal requirements. The ability to ensure that relevant and reliable information about the organisation's market and customers is accessible. The ability to develop and implement business plans.
<b>Examples of job titles</b>	Account Manager, New Business Developer
<b>Criteria regarding product and process (also referred to as indicators)</b>	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Identify and prioritise business objectives;</li> <li>• Develop and agree on business plans and budgets for the achievement of the organisational strategies, setting out clear actions, risks, contingencies, accountabilities and milestones;</li> <li>• Identify and provide the business resources required;</li> <li>• Take account of influences that may affect and shape how business processes work;</li> <li>• Develop business process measures that are affordable and appropriate;</li> <li>• Identify customers' needs, expectations and predicted future demand levels;</li> <li>• Identify and assess current and future developments in your sector, including competitors' activities;</li> <li>• Identify and assess threats to and weaknesses in, the organisation's business plan;</li> <li>• Monitor and report on the implementation and performance of the plan against milestones and budgets.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Effective and sustainable business processes and resources;</li> <li>• Implement effective methods to review and improve business and marketing plans.</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Knowledge of principles, models and measurement tools for effective business management;</li> <li>• Understanding of business decision making for risk and reward against potential investment cost;</li> <li>• Knowledge of the sector trends, market developments and competitor performance that affect business processes.</li> <li>• Knowledge of organisation's aims, goals, structure, values, culture, products, services and processes;</li> <li>• Knowledge of the sources of professional market-research expertise;</li> <li>• Knowledge of methods of gaining customer feedback, and the costs and benefits associated with them.</li> <li>• Knowledge of information software products that assist with collecting and analysing information.</li> <li>• Understanding how to secure competitive advantage;</li> <li>• Knowledge of the legal and regulatory restrictions that may affect the organization's</li> </ul>

	business plans; <ul style="list-style-type: none"> <li>• Knowledge of Industry/sector and organization's requirements for developing and implementing business plans;</li> <li>• Knowledge of sources of advice, and support from business and marketing specialists.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to define business processes and ensure that these are sustainable and effective in their use;</li> <li>• Ability to identify, develop and prioritise business objectives that are consistent with the organisation's overall business plan;</li> <li>• Ability to assess risk and reward against their potential investment cost;</li> <li>• Ability to effectively communicate business plans to relevant stakeholders to ensure understanding and commitment;</li> <li>• Ability to respond positively and creatively to setbacks.</li> <li>• Ability to comply with, legal requirements, industry regulations, organisational policies and professional codes.</li> <li>• Ability to monitor the quality of business performance and progress against plans and take appropriate corrective action, where necessary;</li> <li>• Ability to identify trends and recognise their impact upon current and future business performance;</li> <li>• Ability to obtain advice and support from business and marketing specialists;</li> <li>• Ability to implement, monitor and report on the business plan as agreed and within budget and milestones;</li> <li>• Ability to develop and implement measures and methods for evaluating the implementation of the business plan.</li> </ul>

## TECHNICAL COMPETENCIES

Competency	<b>T1. Contribute to the implementation of functional and technical design of interactive media product/service (IMP/S)</b>
Description	Ability to determine the implementation of designs for IMP/S. Ability to understand functional, design, or other specifications and determining the best way to build the product.
Examples of job titles	Technical Lead, Technical Director
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>Analyse product information, designs and specifications to identify technical requirements and parameters;</li> <li>Evaluate relevant technologies, development or authoring tools, mark-up, scripting or programming languages, and approaches, and decide which are appropriate to use;</li> <li>Determine if and which standards or guidelines must be adhered to;</li> <li>Document research and development activity in the form of technical specifications;</li> <li>Undertake research and develop prototypes as appropriate in order to test ideas, approaches, technologies and tools;</li> <li>Maintain up-to-date knowledge and awareness of current technologies, languages, tools and best practice that are relevant to interactive media product development;</li> <li>Liaise with colleagues to ensure functional specifications are workable;</li> <li>Liaise with the relevant party to obtain approval for functional specifications and decisions.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>Develop prototypes as appropriate to prove ideas, approaches, technologies and tools.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>Knowledge of relevant technical standards and guidelines;</li> <li>Knowledge of different mark-up, scripting and programming languages;</li> <li>Knowledge of authoring tools, development environments and coding tools;</li> <li>Knowledge of relevant and appropriate technologies;</li> <li>Understanding the IMP/S's overall purpose, intended use and requirements, in particular relating to any integration with other systems and any likely future need for maintenance or modification;</li> <li>Knowledge of information sources about latest technologies, approaches, best practice and current trends in the use of interactive media technologies and tools;</li> <li>Knowledge of the resources, capabilities and skills within an organisation and/or available to the project;</li> <li>Knowledge of interaction design issues.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>Ability to interpret and follow functional specifications or other briefs;</li> <li>Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>Ability to identify project parameters and constraints including target platforms and their capabilities;</li> <li>Ability to identify and select appropriate approaches, technologies, mark-up, scripting or programming languages, development environments and other tools with which to develop the product;</li> <li>Ability to appropriately use particular technologies, approaches, languages or tools, and the implications of doing so.</li> </ul>

Competency	<b>T2. Implement functionality of interactive media product/service (IMP/S)</b>
Description	<p>Ability to create and deploy the overall product, using an appropriate development environment (i.e. the authoring tools, scripting language, programming language).</p> <p>Some industry-standard development environments used:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Flash</i></li> <li>• <i>Adobe Dreamweaver</i></li> <li>• <i>Adobe GoLive</i></li> <li>• <i>Microsoft FrontPage</i></li> <li>• <i>PHP</i></li> <li>• <i>ActionScript</i></li> <li>• <i>JavaScript</i></li> <li>• <i>VBScript</i></li> <li>• <i>Python</i></li> <li>• <i>Java</i></li> <li>• <i>Perl</i></li> <li>• <i>C</i></li> <li>• <i>C++</i></li> <li>• <i>C#</i></li> </ul>
Examples of job titles	Web Developer, Web Programmer, Multimedia Programmer, Game Programmer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Assemble, organise and check the required content and assets;</li> <li>• Select and use a development environment to develop functionality according to provided specifications;</li> <li>• Code effectively to provide specified functionality;</li> <li>• Test and debug the product to ensure it operates correctly within specified parameters;</li> <li>• Fix any bugs or problems that come to light from testing;</li> <li>• Liaise with colleagues to ensure functional designs and specifications are correctly implemented;</li> <li>• Respond positively to requests for changes arising from user testing and changes to work schedules and timescales.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Produce code that is readable, re-usable and maintainable;</li> <li>• Clearly document code so that others can understand it;</li> <li>• Deploy the finished product in the appropriate format.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of relevant programming principles and best practice (such as object-oriented and/or procedural programming);</li> <li>• Knowledge of the principles of interaction design and especially issues of usability and accessibility;</li> <li>• Understanding the functions and syntax of the scripting and/or programming language being used;</li> <li>• Knowledge of available development environments, their advantages and disadvantages, and when it is appropriate to use them;</li> <li>• Knowledge of project parameters and constraints including target platforms and their capabilities;</li> <li>• Knowledge of the format in which the product will be deployed (for example, web, CD-Rom, DVD, mobile device, etc.);</li> <li>• Knowledge of the sources of information for help, tips and tricks for making most effective use of the development environment being used;</li> <li>• Knowledge of the implications of requests for changes to functionality;</li> <li>• Understanding the expectations of others who may be involved in debugging, using or modifying the code;</li> <li>• Understanding of data structures and how they contribute to the functionality of IMP/S;</li> <li>• Knowledge of any limitations of the chosen development environment that may affect</li> </ul>

	the smooth operation and usability of the product being created or capacity to de-bug it easily.
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow functional specifications or other briefs;</li> <li>• Ability to clarify requirements or raise issues in response to the functional specification or brief;</li> <li>• Ability to write efficient code that is easy to read, debug and maintain;</li> <li>• Ability to use chosen development environment;</li> <li>• Ability to clearly document code;</li> <li>• Ability to test and debug code efficiently;</li> <li>• Ability to write custom debugging code and have additional expertise in some of the following areas:               <ol style="list-style-type: none"> <li>1. Physics programming</li> <li>2. Graphics programming</li> <li>3. Network programming</li> <li>4. Artificial Intelligence programming</li> <li>5. Logic/mathematical skills</li> </ol> </li> <li>• The ability to structure data in order to achieve functionality;</li> <li>• The ability to meet deadlines in relation to the quality of outputs against the specification.</li> </ul>

## VISUAL ARTS COMPETENCIES

Competency	<b>A1. Produce user interface assets and visual styles for interactive media product/service (IMP/S)</b>
Description	<p>Ability to prepare interface design for technical implementation. Ability to use style-sheets (e.g. CSS, XSL) to create web pages.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Dreamweaver</i></li> <li>• <i>Microsoft FrontPage</i></li> <li>• <i>Adobe ImageReady</i></li> <li>• <i>Adobe Fireworks</i></li> <li>• <i>Equilibrium DeBabelizer</i></li> <li>• <i>Terran Interactive Media Cleaner</i></li> </ul>
Examples of job titles	Computer Graphic Artist, Assistant Producer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Slice a visual design to create component assets (e.g. buttons) in a manner that makes technical implementation as simple as possible;</li> <li>• Follow instructions provided by the interface designer;</li> <li>• Source additional assets, such as sound effects, as appropriate to the designer's instructions;</li> <li>• Select or create appropriate colour palettes for graphical interface assets;</li> <li>• Test and debug your style sheets;</li> <li>• Document style-sheets so they can be understood by others;</li> <li>• Respond positively to requests for changes.</li> <li>• Optimise slicing and preparing interface components to contribute to the smooth and fast operation of the finished user interface;</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Create all the required component assets (e.g. for different button states);</li> <li>• Create style-sheets that comply with relevant standards, guidelines or conventions;</li> <li>• Produce well-formed, robust, accurate and efficient style-sheets.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding of project parameters and constraints including target platforms and their capabilities;</li> <li>• Knowledge of industry-standard software tools and development environments;</li> <li>• Knowledge of sources of information for help, tips and tricks, e.g. for making most effective use of CSS;</li> <li>• Understanding how the assets, style sheets will be used in the finished product;</li> <li>• Understanding when rights clearances are needed to obtain and use assets;</li> <li>• Understanding of the file formats that can be supported by the target platform and/or intended authoring tool;</li> <li>• Knowledge of naming conventions, standards, guidelines or specifications;</li> <li>• Knowledge of usability and accessibility issues relating to graphical or audio interface components;</li> <li>• Knowledge of web pages to which style-sheets will be applied;</li> <li>• Knowledge of the implications of later requests for changes to the product;</li> <li>• Understanding the requirements and expectations of those who may be involved in debugging, using or modifying assets and style-sheets;</li> <li>• Knowledge of CSS syntax;</li> <li>• Knowledge of W3C web standards and accessibility guidelines; Understanding the effect of image colour-depth, resolution and dimensions on file-size;</li> <li>• Understanding the effect of audio, video and animation in the context of interface</li> </ul>



	design;
Skills	<ul style="list-style-type: none"><li>• Ability to interpret and follow specifications or other briefs;</li><li>• Ability to find relevant sources of additional assets, such as style galleries etc.</li><li>• Ability to liaise with others to ensure you obtain the assets you need at the right time and in appropriate formats;</li><li>• Ability to use digital image manipulation tools;</li><li>• Ability to analyse mark-up to determine the page structure and identify the elements you need to provide for in your style-sheets;</li><li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li><li>• Ability to produce style-sheets that are easy to debug and maintain;</li><li>• Ability to clearly document style-sheets;</li><li>• Ability to test and debug your style-sheets efficiently, especially for cross-browser compatibility.</li></ul>

Competency	<b>A2. Produce 2D &amp; 3D animations for interactive media product/service (IMP/S)</b>
Description	<p>Ability to create two and three dimensional objects and environments for animations as part of an interactive media product. It assumes that has one already the necessary drawing and other skills to create animations, and focuses on the application of these in an interactive media context.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe Flash</i></li> <li>• <i>Alias Wavefront</i></li> <li>• <i>Alias Maya</i></li> <li>• <i>Discreet 3D Studio</i></li> <li>• <i>Discreet 3D Studio Max</i></li> <li>• <i>Soft Image XSI</i></li> </ul>
Examples of job titles	Animator, Flash Developer, Interface Designer, Modeller, Artist, Texture Artist
Criteria regarding product and process (also referred to as indicators)	<p><b>Criteria regarding process</b></p> <ul style="list-style-type: none"> <li>• Design animations within specified style guidelines;</li> <li>• Design animations within specified parameters and constraints relating to the target platform and medium;</li> <li>• Create animations that are attractive, easy to use and fit for purpose;</li> <li>• Liaise with the relevant authority to obtain approval for your animations;</li> <li>• Save animations in appropriate formats so that they can be easily incorporated into the product;</li> <li>• Provide clear documentation as necessary for others to incorporate your animations into the product;</li> <li>• Organise animations using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>• Liaise with colleagues, such as designers and developers, to ensure your animations are appropriate and meet requirements.</li> </ul> <p><b>Criteria regarding product</b></p> <ul style="list-style-type: none"> <li>• Animated interface components (such as buttons);</li> <li>• Animated transitions between interfaces;</li> <li>• Objects that animate or move in response to user interaction (such as expanding menus).</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of the relevant standards and conventions relating to user-interface design;</li> <li>• Knowledge of the principles of traditional and computer animation;</li> <li>• Knowledge of 2D and 3D modelling and animation;</li> <li>• Knowledge of the principles of interaction design, especially regarding usability and accessibility;</li> <li>• Understanding the impact of technical parameters such as the target device's processing power, memory, bandwidth, screen size, resolution, colour depth, input device etc.,</li> <li>• Knowledge of the product's purpose and target users;</li> <li>• Knowledge of the expectations and requirements of target users;</li> <li>• Knowledge of the events or user interactions that will trigger your animations;</li> <li>• Understanding of the creative style and overall concept of the product in which texture models will be used;</li> <li>• Understanding of how animation will be used in the product (for example, whether it will play once, loop several times or indefinitely etc.);</li> <li>• Knowledge of naming conventions, standards, guidelines or specifications that you need to follow;</li> </ul>

	<ul style="list-style-type: none"> <li>• Knowledge of the technical processes that will be used in the finished product;</li> <li>• Understanding the different types of rendering effects that can be applied to animation objects and environments;</li> <li>• Knowledge of the effects of camera positions and angles, lighting and reflection on the appearance of animation objects and environments;</li> <li>• Understanding the implications for animation of the interactive environment and the non-linear nature of IMP/S (e.g. the need to plan for points of view or movements you may not have anticipated).</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow specifications or other briefs;</li> <li>• Ability to use appropriate modelling and animation software;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to clearly document animations so that others can use them easily (for example, so that developers can code scripts to access specific frames or scenes);</li> <li>• Ability to supply textures to supplied wire-frame models to test the integrity of rendered objects or environments to ensure they appear correctly from all required positions and angles;</li> <li>• Ability to ensure that the animations provided can be rendered at the required speed and quality within the capabilities of the target platform;</li> <li>• Ability to portray realistic movements that are appropriate to the type of object being modelled and the style of animation required;</li> <li>• Ability to test the integrity of wire-frame models to ensure they appear correctly from all required camera positions and angles;</li> <li>• Ability to create prototype animations as necessary to check the integrity of the movement;</li> <li>• Ability to supply animation assets in an appropriate format;</li> <li>• Ability to organise animation assets using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>• Ability to liaise with colleagues as appropriate to test animation assets and ensure they are appropriate and meet requirements.</li> </ul>

Competency	<b>A3. Produce the music and sound effects for interactive media product/service (IMP/S)</b>
Description	<p>Ability to create sound effects, compose and record music that work in an interactive context.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Sound forge</i></li> <li>• <i>WaveLab</i></li> <li>• <i>Peak</i></li> <li>• <i>CoolEdit</i></li> <li>• <i>ProTools</i></li> <li>• <i>Nuendo</i></li> <li>• <i>Logic Audio</i></li> <li>• <i>Cubase</i></li> <li>• <i>ProTools</i></li> <li>• <i>Nuendo</i></li> <li>• <i>Gigastudio</i></li> </ul>
Examples of job titles	Audio Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Edit existing audio material to create sound effects to meet a brief or specification;</li> <li>• Compose music that is appropriate for the purpose and mood of the product;</li> <li>• Systematically assess the implementation of work in iterative versions and specify changes in effects, volume, pitch and panning;</li> <li>• Liaise with the relevant authority to obtain approval for sound effects and music;</li> <li>• Record music in an appropriate format that can be reproduced within the capabilities of the target platforms;</li> <li>• Provide clear documentation and audio demonstration clips as necessary for others to incorporate sound effects and music into the product;</li> <li>• Organise sound effects and music using appropriate filing and naming conventions so that they can be located easily by others;</li> <li>• Liaise with colleagues, such as designers and developers, to ensure sound effects and music are appropriate and meet requirements.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Generate original sound effects to meet a brief or specification;</li> <li>• Create music that can respond to events and user interactions as required.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of the principles sound design, sound effects and acoustics;</li> <li>• Understanding effect of audio sampling-rates and bit-depth on file-size and data-transfer rates;</li> <li>• Knowledge of when and why a sound effect might be cut-off prematurely, and how to minimise the risk of this adversely affecting the product;</li> <li>• Knowledge of the various types of data compression and their relative merits and demerits;</li> <li>• Knowledge of different formats in which music can be output, and when it would be appropriate to use them;</li> <li>• Knowledge of events or user interactions that will trigger sound effects in the product;</li> <li>• Understanding of how sound effect and/or will be used in the product (for example, whether it will play once, loop several times or indefinitely etc.);</li> <li>• Understanding what is required for the music to change in response to events or user interactions (for example by changing key or tempo, or by segueing into another piece);</li> <li>• Knowledge of compatibility issues between mono, stereo, multi-channel and surround sound;</li> <li>• Understanding when permission is needed to use material created by others;</li> <li>• Understanding the limits of what can be legally done with material created by others</li> </ul>

	<p>before permission is needed;</p> <ul style="list-style-type: none"> <li>• Knowledge of relevant naming conventions, standards, guidelines or specifications</li> <li>• Understanding requirements and expectations of other team members who will use the sound effects created;</li> <li>• Knowledge of the different technologies used in a computer-based music studio, including samplers, sequencers, MIDI devices, 'outboard' recording studio hardware and mixing desks.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to interpret and follow specifications or other briefs;</li> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to locate sources of audio material suitable for meeting the creative brief;</li> <li>• Knowledge of the types of audio effects that are available and their suitability for different products and contexts;</li> <li>• Ability to use sound effects to enhance the user's experience and/or give feedback on user interactions;</li> <li>• Knowledge of the appropriate file formats for saving sound effects;</li> <li>• Ability to layer sounds to achieve a combined audio effect or to produce a complex replay of elements with logical replay rules;</li> <li>• Ability to use various techniques for synchronising sounds to moving images;</li> <li>• Ability to record, edit and implement post production of dialogue;</li> <li>• Ability to assess and specify music requirements as necessary;</li> <li>• Ability to sample audio from legitimate sources and use sound samples in your composition;</li> <li>• Ability to use appropriate software to record, sequence and mix audio;</li> <li>• Ability to address the challenges of scoring music for non-linear medium with scenes of indeterminate length by employing techniques like branching segments and the use of music layers mixed dynamically at run-time.</li> </ul>

Competency	<b>A4. Produce video for interactive media product/service (IMP/S)</b>
Description	<p>Ability to produce and stream video in an interactive context, with a focus on video post-production, effects and compositing.</p> <p>Some examples of industry-standard software used are:</p> <ul style="list-style-type: none"> <li>• <i>Adobe AfterEffects</i></li> <li>• <i>Avid</i></li> <li>• <i>FinalCut</i></li> <li>• <i>Adobe Premier</i></li> <li>• <i>Flash Media Server</i></li> </ul>
Examples of job titles	Digital Video Designer
Criteria regarding product and process (also referred to as indicators)	<p>Criteria regarding process</p> <ul style="list-style-type: none"> <li>• Correctly prepare video files for post-production and compositing;</li> <li>• Set time code to meet post production requirements;</li> <li>• Synchronise time code with other sources, or provide a master reference;</li> <li>• Clearly mark the video media files for identification.</li> </ul> <p>Criteria regarding product</p> <ul style="list-style-type: none"> <li>• Generate composited video to meet a brief or specification;</li> <li>• Create video that can respond to events and user interactions as required;</li> <li>• Create video streaming appropriate to the requirements of the IMP/S.</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of the principles video design, post-production and streaming;</li> <li>• Understanding effect of video sampling-rates and bit-depth on file-size and data-transfer rates;</li> <li>• Knowledge of different formats, codecs, compression and streaming methods in which video can be output, and when it would be appropriate to use them;</li> <li>• Knowledge of events or user interactions that will trigger video effects in the product;</li> <li>• Understanding when permission is needed to use material created by others;</li> <li>• Knowledge of the different technologies used in a computer-based video studio, including post-production, compositing and streaming applications;</li> <li>• Knowledge of post production requirements for correct time codes;</li> <li>• Knowledge of the differences in cost and functionality between true streaming (using a streaming server) and progressive download;</li> <li>• Knowledge of the streaming media object model including the connection, session and stream objects.</li> </ul>
Skills	<ul style="list-style-type: none"> <li>• Ability to clarify requirements or raise issues in response to the specification or brief;</li> <li>• Ability to locate sources of video material suitable for meeting the creative brief;</li> <li>• Ability to use video effects and compositing techniques as appropriate for different products and contexts;</li> <li>• Ability to use video effects to enhance the user's experience and/or give feedback on user interactions;</li> <li>• Ability to use various techniques for synchronising images with sound or dialogue;</li> <li>• Ability to assess and specify video requirements as necessary;</li> <li>• Ability to sample video from legitimate sources and use samples in the composition;</li> <li>• Ability to use appropriate editing, compositing and streaming applications;</li> <li>• Ability to provide safe storage for the video files;</li> <li>• Ability to create streaming video applications using streaming servers or progressive download.</li> </ul>

## References

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