Technology Transfer at IBBT-EDM: Case Study in the Computer Graphics Domain

Fabian Di Fiore, Eddy Flerackers, and Frank Van Reeth

Abstract In this paper we will report on the founding of Ultra Pictura as a case study of technology transfer from academia to industry. Ultra Pictura specialises in capturing and recreating animated painterly artwork techniques. By means of a proprietary digital paint and render platform Ultra Pictura offers animation production studios a service solution that enables artists to create totally new and original 2D painterly animation styles for animated backgrounds, characters as well as special effects.
Ultra Pictura was founded in October 2010 as a spin-off initiative of the Interdisciplinary Institute for BroadBand Technology (IBBT). IBBT is a research institute founded by the Flemish government to stimulate R&D in innovative ICT services and applications in close collaboration with government and industry. By offering both research support and go to-market assistance, IBBT creates the right eco-system for the translation of research results into marketable products creating real social and economic benefits. Through the use of tools and hands-on training and coaching, researchers (academics as well as individuals) learn to take their innovations to market and thus maximise the valorisation potential of the research results. The final step in the IBBT's innovation pipeline is the venture stage which ultimately leads to the creation of new innovative start-ups.

Key words: Computer Graphics, Animation, Computer Animation, Stylised Animation, Technology Transfer

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1 Interdisciplinary Institute for BroadBand Technology (IBBT)

IBBT is a research institute founded by the Flemish government to stimulate R&D in innovative ICT services and applications in close collaboration with government and industry. IBBT develops interdisciplinary demand-driven solutions so as to maximise the economical and societal impact of the research results. To this end, about twenty ICT research groups from Flemish universities have been put together to take on this challenge. These academic researcher groups collaborate with teams from large companies, SME's, non-profit organisations and government representatives both in local and European research projects.

By building upon the joint expertise of these groups, the IBBT has become a strategic research partner to the industry and the society in Flanders and abroad. Furthermore, by providing both research support and go to-market assistance, IBBT is creating the right eco-system for the translation of its research results into marketable products creating real social and economic benefits. Figure 1 depicts IBBT's pipeline for turning a successful new business idea into a reality. The following subsections will elaborate on the different steps involved.

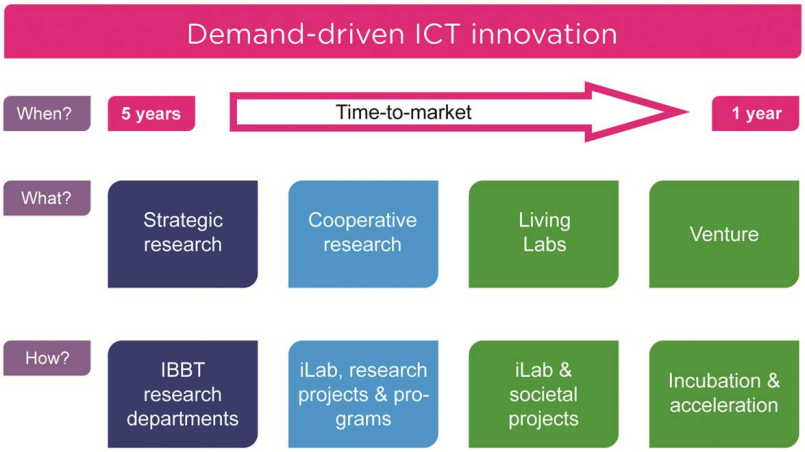

Fig. 1 IBBT demand-driven ICT innovation: from idea to business.

1.1 Strategic Research

IBBT's research organisation is structured in five research departments (see Figure 2) with a special focus on the most important technological challenges for the upcoming decade: *Digital Society*, *Future Health*, *Future Internet*, *Future Media &*

Imaging, and *Security*. The main goal of the organisation's departments is to obtain more critical mass through focus and efficient leadership in order to have in place the conditions necessary to reach the required level of world-class research in the different domains. To this end, each department elaborates the expertise of a multidisciplinary team of researchers coming from several research teams.

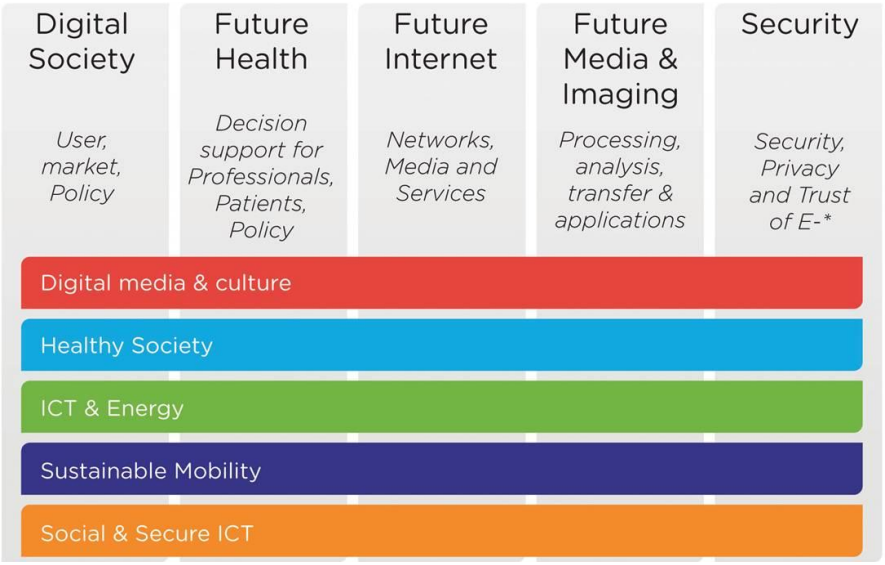

Fig. 2 IBBT strategic research organisation. Top row) Five research departments. Bottom rows) Research subjects.

1.2 Cooperative Research

IBBT plays many roles in the creation and execution of interdisciplinary collaborative projects between IBBT research groups and external partners such as companies, governments, and non-profit organisations. It can provide infrastructure, equipment, services such as testing, bring partners together and provide some of the financing. Always keeping in mind the need to create economically-effective solutions that are marketable and user-oriented.

Project proposals are formed bottom-up by the external partners, need to be demand-driven and within the framework of the IBBT innovation themes (see Figure 2), and are always submitted by a consortium in which several partners can participate. There are no restrictions regarding organisational form, so governments as well as non-profit organisations, SMEs, large companies and local branches of multinationals can participate next to the IBBT research groups. IBBT finances up

to 50% of the total research cost. The external partners have the possibility to apply for financial support from the Flemish Government Agency for Innovation by Science and Technology.

The goal of the research projects is to deliver real results by means of prototypes which can then be turned into applications to daily life by our partners or spin-off companies.

The interdisciplinary teams have carried out over 250 research projects in close collaboration with over 700 partner organisations since the foundation in 2004. IBBT disposes of an annual research budget of about 30 million EURO for supporting this research.

1.3 Living Labs

Applied ICT research is unthinkable without elaborate testing. Successful products and services need to be tested in real-life circumstances before they are absorbed in a business model and rolled out to the target audience. Such a testing environment is called a living lab. A living lab evaluates the practical feasibility of ICT innovations at the earliest possible stage of development, reducing the time needed to attain proof of concept.

Two complementary infrastructures are provided by IBBT. The first, *iLab.o*, helps to set up a large-scale trial outside the lab environment. Representative users will get the chance to test ICT innovations over a longer period of time in their daily environment. iLab.o also provides the selection, recruitment and coaching of the test users. The second infrastructure, *iLab.t*, provides lab infrastructure to evaluate technical feasibility, performance, and service quality of ICT innovations at the earliest possible stage. The collaborators at iLab.t measure the performance and service quality of your ICT innovation and compare it with existing standards.

Notice that in a living lab a large number of users gets to interact with new products and services in their daily – both professional and private – life. This heavy user involvement distinguishes a living lab from traditional market and user research. It is also worthy of note that these kinds of living lab activities are based on a scientific research methodology while leaving room to innovate and develop further.

1.4 Venture

The final step in the IBBT's innovation pipeline is the venture stage. Through the use of tools and hands-on training and coaching, our researchers (academics as well as individuals from the research partners) learn to take their innovations to market and thus maximise the valorisation potential of the project results, leading to the creation of new innovative start-ups.

The complete venture co-operation model consists of six components, each of which focuses specifically on major themes or issues that newly formed companies must face.

IPR focuses on the protection of intellectual property. After all, companies do not always realise that acquired knowledge, original ideas or inventions can be used by others if they are not guarded and protected.

iStep training programmes address specific topics which are of importance when starting up a company: choosing a business model, creating a business plan, explaining IPR, team building, defining a marketing strategy, drawing up a financial plan etc.

iBoot aims for teams to look at their projects from a number of different angles, such as technology, marketing, finance etc., and to study any potential opportunities and risks in detail with the help of a number of professional coaches. At the end of the iBoot the different teams have to present their project to a jury of experts, including venture capitalists, who then give feedback and advice.

iStart focuses specifically on the further development and commercialisation of technology and the results of research projects. Participants have the opportunity, as a real potential entrepreneur under the wings of IBBT, to create a business model, to develop prototypes, to carry out market research and field trials and, on the basis of these, to present a strategy for commercialisation and a financial plan. Using the results of this incubation phase it is assessed whether the company in question is ready to take the next step. Also, on the basis of a number of criteria it is decided whether the product has to be internally or externally taken further, or whether licensing possibilities are present or if a project may possibly lead to the setting up of a spin-off, etc.

iCubes deals with finding a home for your business. Spin-offs and innovative companies which establish themselves here can count on every possible facility including furnished offices and meeting rooms, reception desk and secretarial office, and a ready-to-use IT and telecommunications infrastructure.

iVenture is an investment fund of IBBT that also invests in IBBT spin-offs in the preseed phase of the research. iVenture is only aimed at projects within the IBBT eco-system and in this way provides preseed, start-up and early-stage funding (via a system of convertible loans) for setting up start-ups.

2 Expertise Centre for Digital Media (EDM)

The Expertise Centre for Digital Media (EDM) is a research institute of Hasselt University (UHasselt) and has been active in Information & Communication Technology (ICT) R&D since 1987 (EDM 1987). EDM employs a team of about 70 ICT specialists in fundamental, basic & applied research as well as contract R&D. EDM currently has two main activity domains: Visual Computing and Human Computer Interaction. Its key objective is to be a leading research institute in multimedia, human-computer interaction, computer graphics and virtual environments.

The research at EDM is partially funded by Hasselt University, generally meant for faculty, teaching assistants and fundamental research projects. The majority of the research budget, however, has an external origin (governments, non-profit-organisations and industry), IBBT being a main source of this funding.

EDM is involved in the Interdisciplinary institute for BroadBand Technology (IBBT) from the beginning (2004) and takes part in the core department 'Future Internet'. The core of this department is to provide a platform that will support the natural interaction between humans and their environment, enabling services in a wide range of application domains and interconnecting the world in order to obtain a sustainable smart society.

Through the years EDM gave birth to ten spin-off companies of which ANDROME is the leading one. ANDROME also takes the role of parent company for almost all other spin-offs.

3 ANDROME

ANDROME is a spin-off company of the Expertise Centre for Digital Media (EDM) and has been active in animation related R&D projects since more than twenty years (ANDROME 1990). Complementary to its other important strand of its R&D activities in the networked media domain, the animation related R&D has always been considered as an important pillar on which future business opportunities can be developed.

The research projects at ANDROME are mainly funded by organisations like the EU, Flemish Government Agency for Innovation by Science and Technology, and the IBBT.

4 Case Study: Ultra Pictura

Currently IBBT has three spin-off companies that were founded by EDM and ANDROME: TinkerTouch (TinkerTouch 2010), Camargus (Camargus 2010) and Ultra Pictura (Ultra Pictura 2010). The following sections will elaborate on the case of Ultra Pictura.

4.1 Company Summary

Ultra Pictura offers animation production studios that are constantly looking for new artistic ways of expression, a service solution that enables artists to create totally new and original 2D painterly animation styles for animated backgrounds, characters as well as special effects. Figure 3(a) shows what presently happens in 2D animation production: due to creative and technical constraints, animated characters are flatly coloured over a painterly coloured background. Figure 3(b) indicates what Ultra Pictura can offer: using its creative insights and innovative software tools, animated characters can be coloured in the same painterly style as the underlying backgrounds.

(a) (b)

Fig. 3 a) Traditional 2D animation production. b) The Ultra Pictura production.

Working with Ultra Pictura's services will have a profound impact on the overall look of animated storytelling and alleviates creating new styles of animated imagery, with the potential to open a completely new animation category beyond traditional two-dimensional animation and three-dimensional computer animation. Figure 4 illustrates the myriad of potential styles that we can address.

4.2 From Idea to Business

Ultra Pictura was founded in October 2010 as a spin-off initiative of ANDROME, EDM and IBBT. In addition, it has a strategic alliance with production company Walking The Dog (Walking the Dog 2000) giving the company the opportunity to work for and with important players in the animation business. The Ultra Pictura team, hence, has respective firm roots in the market at issue regarding business/development (software company link), production/marketing (producer / animation studio link) and research & development.

Table 1 lists all past activities involved in setting up the company. EDM has been working in computer graphics and animation since 1987, which has given rise to a substantial amount of know-how in these fields (Di Fiore 2004, Van Laerhoven 2006). Over the years, the EDM (and hence IBBT) activity domains have been extended to include non-photorealistic animation and rendering (NPAR).

ANDROME has been active in R&D on 2D animation since its involvement in 1997 in ERASTA, a European ESPRIT FP4 R&D project. Various R&D projects – funded internally, through the EC and through IWT[1] – as well as commercial projects followed, resulting in a total investment of about 3.8 MEUR.

The research efforts of EDM and ANDROME on stylised animation were started in the EU research project CUSTODIEV (IST EU R&D project FP V, October 2002 – March 2005). The main R&D topic involved around animating image sequences in the 'carte à gratter noir' (scraper board) style as well as image sequences in airbrush styles (Di Fiore & Van Reeth 2003, Henzen et al. 2005, Di Fiore et al. 2006).

IBBT became involved through the organisation of its first iBoot, in which a team was selected and supported to work on a business study around painterly stylised animation during Q2 of 2008. The iBoot was followed by an IBBT incubation project on painterly stylised animation (Q4 2008 – Q1 2010) of which the main goal was to step in with a new approach to highly stylised animation offering a new perspective on computer-assisted animation production in which the problem of 'animation sameness' in 3D animation and of 'colouring sameness' in traditional animation are tackled.

Aside the technological R&D, together with ANDROME new business modelling opportunities were investigated in a cooperate research project during the period Q2 2009 – Q1 2011. Finally, the IBBT iVenture investment fund provided early-stage funding (via a convertible loan) for setting up the company.

4.3 Company Management

At present Ultra Pictura organisationally is arranged around a core team of three people as fixed personnel and a floating number of people which are hired on a free-lance basis depending on the need in the commercial subcontracting/production activities. A management committee has been set up, with the core team and representatives of the board, in which the medium- to longer-term activities of Ultra Pictura are discussed.

The core team consists of (i) a creative director with an extensive background in animation as well as business development, and (ii) two technical directors, former employees of IBBT-EDM, each having a Ph.D. in computer science. The CEO of ANDROME will act in the initial years as CEO of Ultra Pictura. The vice director of IBBT-EDM is a member of the management committee as representative of ANDROME and to maintain the innovation link towards IBBT; the CEO of Walking

[1] Flemish government agency for Innovation by Science and Technology

Period	**Activity**	**Funding**	**Partners**
1987 – ...	R&D on computer graphics and animation		EDM
1997 – 2002	R&D on 2D animation	European (ESPRIT FP4) and National (IWT)	ANDROME EDM
2002 – 2005	R&D on 2D stylised animation	European (IST EU R&D FP5)	ANDROME EDM CNBDI (France) Siriol (UK) Glasgow University (UK) Philips (NL)
2008	iBoot on stylised animation	IBBT	ANDROME Walking the Dog IBBT-EDM
2008 – 2010	iStart	IBBT	ANDROME
2009 – 2011	R&D on stylised animation	National (IWT)	ANDROME
2009 – 2011	R&D on business modelling	IBBT	ANDROME
			Walking the Dog IBBT-EDM IBBT (other)
2010, October	Founding of Ultra Pictura		ANDROME IBBT Walking the Dog
2011	iVenture	IBBT	Ultra Pictura

Table 1 Ultra Pictura: from idea to business.

the Dog is member of the management committee as representative of Walking the Dog and to maintain the link towards the market.

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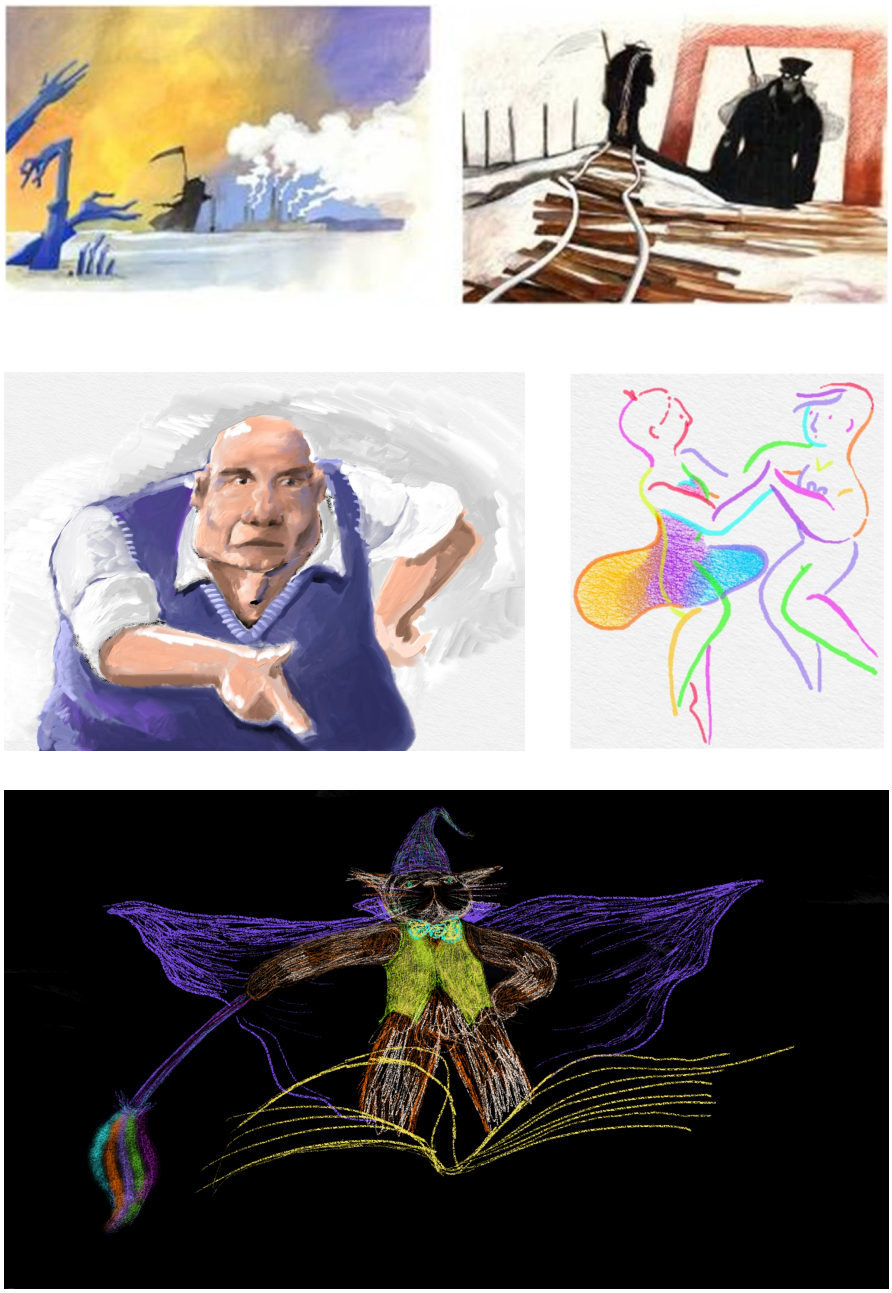

Fig. 4 Artworks illustrating the content styles which can be animated through Ultra Pictura. (1st row) © Marie-Anne Bonneterre. (2nd row) Left: © Bart 'Pokke' Van Bael. Right: © Lesley Keen. (3rd row) © Lesley Keen.