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Developments in America

Abstract

Current issues on model making in America are discussed such as: opportunities for employment, the impact of new technologies and materials, differences in employment strategies between diverse disciplines such as product prototyping and special effects model making and the collaboration between the University of Hertfordshire and similar universities in North America on research and student exchange programmes. Discussion will focus on those issues and how they affect the changing role of the traditional model maker. The need to embrace the effects of change to create new opportunities for ourselves will include a look at some of the strategies being used by US professionals to shape up to a changing world.

Developments in America

We are here today because of an interest in the future of our profession and out of a sense of curiosity for what each of us may glean from this conference. This emotion is something I am very familiar with having flown to the US last October to attend the 3rd annual conference of the Association of Professional Model Makers. (Most of you probably haven't travelled quite so far today but are just as keen to find out as much as you can from us here.) How relevant was travelling to the US to discover what was happening there and what bearing does anything they do have for us here in the UK?

My reasons for attending were many, not least of which was the desire to meet fellow academics with a view to forming a collaborative venture leading to a staff/student exchange programme. Certainly I was keen to find out more about advances in technology that may affect our profession here in Britain. Issues raised during this conference and in the last six months of pursuing topics that arose from that visit, are the subject that I intend to discuss here today. Briefly these comprise:

- Impact of new technologies and materials
- Employment prospects in the US
- Strategies adopted by American professionals to cope with change
- Exchange programmes in North America

My own research into RP & its influence on our industry? You will see from this that there are essentially two strands to "Developments in the US", firstly I intend to discuss what is happening within the model making profession in the US and secondly how we (here at UH) are developing links with North America through RP research and exchange programmes. For some of you, what I have to say may not seem new or different from your current practice and for that I apologise in advance, many of you though will have had your first experience of RP&T today and what I have to say may help to put the implications of this new technology into perspective for you. Some of you will be particularly interested in employment opportunities in the US, others more in these new technologies. Something that struck me as a result of attending the APMM Conference was how willingly the Americans seem to embrace technological change, rather than seeing the advances in RP&T as the death knell of the model making profession, it would appear that they have harnessed it to free them from drudgery! Strikingly, another issue of importance to them was that of professionalism and the need to be recognised as professionals. When the APMM recently merged with the former American Engineering

Model Society (AEMS) they actively urged their members to stress and promote their professional status through actions such as:

- Labelling all models with their company name followed by "Professional Model Maker" (PMM)
- Signing all documents with a PMM after their name
- Using the APMM logo on all stationery in addition to their company logo
- Telling clients that they attended the APMM Conference and what exciting new things they learnt from being there
- Writing articles for the APMM newsletter on current issues and new technologies or best practice and sending copies to their clients.

Now all these things are very American so please forgive me if you feel that they may not meet with our more reserved British character but the point I am trying to illustrate here is their involvement with the APMM as members and the standing that the Association has within the profession. Also the value to them of holding an annual 3 day conference as a forum for the profession. I understand that there used to be some form of association here in the UK in the past, although it faltered for some reason. At the risk of blowing our own trumpet here at UH, perhaps this conference today could grow into an annual event which could reflect the diverse nature of the model making industry in this country and even benefit perhaps from linking with the APMM. It may not be practical for us all to attend their US conferences or for them to come here but perhaps in the future it may be possible to run our conferences jointly through a live video conferencing link, or through the Internet even. I would welcome any comments or technical advice from those of you who see this as advantageous.

For those of you who would be interested in attending the next APMM conference it is in late August in Boston this year, get together and go as a British contingent? Perhaps we in Britain could adopt the APMM as an International umbrella organisation working for the future of model making worldwide? The advances in technology mean that we compete in a truly global arena. With RP&T, designs for new products can be generated using CAD in this country and then sent via modem across to the States or the "Pacific Rim" where they can be produced by service bureaux and then back to the UK by the growing army of freight and despatch companies such as DHL or UPS etc. For us to maintain our share of this global market in this country we need to keep abreast of these advances and be proactive in meeting the international standards that are required.

Some of you may be interested to hear that on joining the APMM you are automatically able to participate in their Internet Mailing List. This list is a forum for APMM members and associated professionals to share information, ask questions, seek advice, offer technical assistance, post Situations Wanted and Situations Vacant notices. An Internet Mailing List is one of the simplest Internet communication functions. It's like having an E-mail partyline; when someone sends a message to the list, everyone on the list receives a copy. I am aware that gathered in front of me today, you as an audience may range from students, model makers working in various disciplines or managers of small to medium or even extremely large companies. The students among you that are looking for your first job, model makers looking for an exciting new job, or managers looking to expand their businesses, may be interested to know that the APMM Conference is used by the US model making industry as a graduate recruiting fair. Those of you looking for your first job or a change from your current one may do well to invest in the fare and the entrance fee and take along your portfolio to sell yourself into a future career in the US!

This brings me to the point I want to make about the shortage of skilled model makers in the US. I apologise if this seems to be promoting a "brain drain" from the UK but it is evident that people like us are in short supply over there and they reward those that they can get, with higher salaries than are offered here. Each graduate from a painfully small handful of model making schemes in the US are guaranteed the choice of between three

& five jobs. in other words 100% employment prospects. Many of the representatives from industry, such as Hasbro Inc, Fiskars, Satellite Models, Fusion Design, Blue Radish Studios etc. were very impressed by the quality of our student work as described by the portfolio of slides and photographs that I had taken with me to the conference. The overriding feeling was one of, "if you have people with talent like that who are not employed yet, send them out here". Obviously there is still the green card issue to be addressed, although in areas where skilled people are in short supply such as this, the problem can be overcome by the company applying through the appropriate federal department. Why is there such a shortage of people? Well as I said earlier there are only a handful of places offering model making schemes/courses. More importantly though is the fact that with all the advances in new technology such as RP in the product field and laser cutting in architectural disciplines, model makers are being inundated with work and there are too few of them to go around, or at least that is the impression that I got from the conference.

There was a great deal of talk during the various seminars and discussion sessions about the reduction in time to market and development times being dramatically reduced. What this means of course is not that the work available gets done quicker by fewer people but that more work arrives to keep everyone just as busy. At the conference I spoke to a lot of people, all of them seemed desperate to find well trained qualified people as there seems to be more work than there are people to do it. This viewpoint as I have indicated comes mainly from the product and architectural model makers that I spoke to.

I had a long conversation with Gene Rizardi, special effects model supervisor on the recent Apollo 13 movie and veteran of the specialist spaceship model making fraternity. He was saddened by the fact that Computer Generated Imagery (CGI) was taking away his space ships on shows such as Babylon 5 etc. but he cited his experience of Apollo 13 as an example of the computers not completely having the upper hand. Digital Domain, the effects company for the film, used 4 Onyx machines and employed operators for them to keep them working around the clock at a cost of over \$250,000 per seat, to enhance models produced by over 70 model makers also employed by them. Digital Domain he says are beginning to realise that it is cheaper to provide a bench and a light bulb for every model maker that brings along their own toolkit, than it is to buy more and more expensive memory for their machines which in a short while are superseded to become very expensive paperweights. He felt that there was still a great deal of work that would still be available and not superseded by the advance of CGI. In general he felt that the variety of films would expand through such technology i.e. Toy Story, but not replace the breadth of films available that are produced utilising the craft skills of professional model makers. Gene was keen to stress though that model makers in the effects business needed to keep abreast of technology that could make their life easier. He said that he often sent work out to specialists with equipment such as CNC mills and laser cutting when it was feasible and that it took some of the mundane elements out of some aspects of the job. Does the use of these new technologies that are increasingly being used in the US pose a real threat to the model making industry, or is this something that has happened before? If we look back less than a decade ago to when CAD CAM & CNC mills seemed set on usurping the role of the model maker or at least to bring about a re-skilling, it is easy to see how this was natural scepticism about change. We can see now that the worry was over the damage that these systems might do to us rather than, how can these new developments be used to our advantage and create more opportunities for the future. What many of us felt then I'm sure was that if CAD and Computer Rendering were able to check for form, fit and function, through to photo realistic rendering, then why make the physical model? The bit that we probably hadn't come to realise was that the people that make the financial decisions can't visualise in 3D. Having this information available in 2D simply wasn't enough to allow them to be confident in their decision making. What was still

required was the physical model that allowed them to "feel" if it was right, so of course models continued to be made. Because they could design more products faster with those new toys, that ultimately meant of course that more models had to be made after all. Will today's advance of new technology in the form of RP pose similar threats to us? The feeling at the APMM conference was of an upbeat optimism for the future regarding RP&T. That these machines don't just run themselves but need creative people to do it was one strategy but if, like CAD CAM & CNC did in the past, these new toys bring a greater proliferation of products that need to be made. Then surely they can help everyone in this business to spend more time being challenged and less time doing the time-consuming, repetitive and less interesting aspects of the job. Many of them felt that with the drudgery taken out there would be far more time spent doing the quality work that they enjoyed most and that's what the Americans found most exciting.

This does in fact mirror current practice here in the UK where many architectural model making firms embraced CAD CAM & CNC and now use laser cutting for fast precision made models. By having the CAD file for the building, parts could be grouped together like a kit and then sent via modem across to the States in the evening as they finished for the day. Whilst they are sleeping the parts are laser cut in the States because it is still daytime there and at the end of their day are sent by DHL courier back to the UK, to arrive for the beginning of the next day's work, just like having little elves to make shoes for you overnight! The great advantage of working like this, is that these model makers free themselves to create beautiful models that are extremely accurate and they can spend far more time finishing the model to a higher standard than they ever had time to do before. All this at the same cost, thus ensuring they always have lots of work coming in as the client is always more than satisfied! Therefore by embracing new technology companies have reaped unexpected benefits, outcomes that can combine a mixture of traditional and new technologies in innovative ways look like expanding opportunities for the future. One such development being in the area of soft tooling created through combining traditional silicone moulding techniques for replicating parts with RP models. Many Americans were excited by the potential for expansion that this could generate. If more and people are able to bring their ideas to fruition in the market place, through low volume production runs made easy by the cost of tooling having been slashed by this process, then they will probably see many more creative ideas reaching the market than ever before, this being because not so many have to be sold to cover the cost of the previously high cost of hard tooling. That of course means more work for the model makers in producing these items, and their clients benefit by coming to the model making company knowing that they can trust them to choose the best method appropriate to the product. Cost effectiveness in this case is measured by a reduction in time to market for the product, otherwise known as Time Compression Engineering. For indeed, merely achieving reductions in the cost of the model are not the goal, the goal being for the client to get their product to market quicker than their competitors.

This paper is not the place for a detailed account of all the RP&T processes available for you as model makers to use. More importantly though, I would like to comment on the most recent advance in the development of this computer controlled ability to print 3D models, coming out of America. This is known as Ballistic Particle Manufacturing (BPM) and the process it utilises is actually a form of printing. 3D printing. The machine sits next to your computer in an office environment and when you press print, instead of a 2D graphic image that has been photo rendered, you get a 3D model. The machine uses laser ink jet technology and instead of printing ink it prints plastic (ABS, Styrene or Wax). The company stresses that this is not directly comparable with RP processes in that the tolerances don't match up to those typical in engineering but that it is an in house process to aid design realisation and this is reflected in the price, a mere \$34,000 - (£21,000). This is a far cry from the £250,000 needed to purchase the 3D Systems SLA 250

Stereolithography machine, which although comparable in size to the BPM is far superior to it in the standard of model build, finish and tolerance required. In briefly describing this new machine I have no intention of acting as un-paid sales rep for BPM Technology Inc. of South Carolina, but intend it as an illustration of how this technology is continually evolving and coming down in price. This machine and others like it are being imported from the States in the next few months and this is without the Japanese really attempting a share of the market as yet. To conclude my comments on technological change in the US, I would like to reinforce the feeling expressed at the APMM conference, that regardless of the changes that come about it will be difficult to do away with people with our abilities. These technologies may dispense with some of the more traditional skills but ultimately people cannot be automated. Those uniquely human abilities; art, craftsmanship, creativity, innovation and problem solving skills abound within people in this profession and there will always be a demand for that regardless of future change.

So far I have dealt with what is or was happening in the US and issues that arose from the APMM conference. To expand on developments also connected to that visit I would like to deal now with important developments for us here at the University of Hertfordshire (UH). As I said earlier a major factor in attending the conference was our desire to implement an exchange programme with a similar scheme in North America, we have indeed achieved a successful outcome in that we are currently making arrangements for two separate programmes, one in the mid west and the other in Canada. The distinct advantage of this collaboration is not only in the student experience but additionally in complementing current high standards of provision here at UH. Both the institutions in North America were looking to develop a more creative approach to encompass more design and craft based skills, a move away from their (historically) technologically biased structure. Conversely we were wanting to expand our provision by including those new technologies that we are discussing today. Excellent opportunities exist through these links for collaboration with model making companies on both sides of the Atlantic. Research into RP&T is an integral component of the exchange programme with participating companies being likely to benefit from the results of my research into the influence of RP&T on the model making profession-registered research by myself currently leading toward an MPhil/PhD.

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