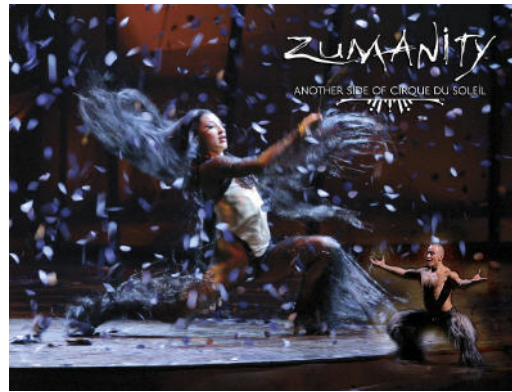


department, but they each have very distinct responsibilities regarding the show. And it may well be possible that you can retrain the existing technician base in a theatre which moves into automation, but you need to understand that in order to operate and maintain new equipment and new automation systems, the technicians do need to develop new sets of skills.

One of the other things we are going to see as described by John Hastie and others is an increased availability of low-cost hoists, winches and motor devices. The average cost of the new winch systems in Holland was reported to be about €30,000 (£20k US\$36k) per unit. That is consistent with major winch costs that we are experiencing in the US at present. However, we are not going to gain market share in schools, colleges, churches, and special event venues with prices on a per axis basis at that level; we need to see lower-cost products coming into the market to gain a wider usage.

One of the advantages that lighting and sound equipment manufacturers have is that everybody uses this equipment; the market is so large that there is an economy of scale. Up until recently, it has only been the commercial and subsidised theatre that could and has afforded to pay for the new developments in automation. It is interesting now to see that there is a trickle-down effect with systems coming into the smaller regional theatres and it is important that that goes farther. Part of that increase will be an increased awareness and penetration of automation systems and mechanical devices into the academic milieu. Universities are going to start having more in-depth training in automation, separate from basic rigging or lighting, in their technical theatre departments. Ultimately that is going to feed the requirements for specialist technicians in these new departments throughout the world.

Cirque du Soleil, with its rapid expansion in the last few years, has noted a significant lack of trained staff able to come into our venues. We do have a fair amount of staff turnover. Sometimes this loss is to the competition; another show will open down the street or in a different town and people whom we have trained will leave. That attrition is a serious problem because we need people to replace them quickly. We cannot wait, and so for all of us it is going to be very beneficial to see trained theatre technicians coming out of an academic teaching programme with real knowledge and understanding of stage automation systems and their applications.



An image of 'Zumanity' a show in Las Vegas by Cirque du Soleil

Four years ago when we standardised on Stage Technologies equipment for Las Vegas, one of the things that we pushed was the notion of being able to train staff and cross-train staff, and have people available who could move easily between our venues. In the first three years of our existence, *Zumanity* and *Kà*, Steve Wynn's *Le Rêve* and a few other shows opened and we noticed a real drain of our trained people

who went off to work elsewhere. When we did the *Le Rêve*, we actually were able to recruit many who came from other venues with knowledge of how to work in our theatre. This ability to get through in a way that was less of a team was just meeting for the first time and the learning curve about what the show had

This chapter provides a wide-ranging view of stage automation, from the way it is developed and used by Cirque du Soleil from Don MacLean, the effect it has had in the Royal Opera House from Geoff Wheel, and an overview of its effects and uses in all types of theatres from Mark Ager of Stage Technologies.

I would like to see a move towards a more open-system architecture. What I mean by that is an inter-operability of many manufacturers' components within a single system. Up until recently, most automation control systems have been of a monolithic design. Each manufacturer or vendor has provided control consoles, motor control racks, drives, hoists and other devices. Now, as we get more sophisticated equipment and applications, we are going to find that a particular device or actuator made by one firm is the most appropriate thing for a particular effect, and there will need to be a lot more precision in how we apply these devices to the stage effects systems. We need to make sure that the control systems are able to use this equipment and integrate it into an entire system *simply*, because we don't want to be spending a lot of time integrating this particular device or component when we all have shows to do – even Cirque du Soleil with a scheduled three-month rehearsal period and two-month load-in! If you've got four hours to do a turn-round you have a