So you want some interactive exhibits! What to do next
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This paper provides some practical advice for museum professionals who want to get started in commissioning the development of interactive exhibits. It is not an exhaustive description of everything you need to do but it will give you some idea of the sort of things required.

Step 1: Generating ideas
The first thing you will need are ideas that can be turned into interactive exhibits – possible activities, interesting areas of content, things that you have seen elsewhere and so on. Here are some ways to generate useful ideas

- Run brain-storming sessions with colleagues from your own and other museums. It is important to set aside thoughts about budgets, project programmes and other constraints for a while and allow yourself free rein to come up with imaginative ideas
- Visit other museums, art galleries, science centres – see what they have done but look critically at their exhibits as there will be bad examples as well as good ones
- Visit contemporary art exhibitions – installations and interactive artworks are a rich source of inspiration and of potential exhibit developers. The Royal College of Art Summer Show is always worth a visit as is the Turner Prize and, if you can get there, the Ars Electronica festival in Linz, Austria (see http://www.aec.at/en/index.asp).
- Go on site visits to factories, laboratories, trade shows and other places where innovative design and technology is being used
- Visit some of the on-line community sites for exhibition developers such as Exhibit Files at http://www.exhibitfiles.org/
- Write a creative brief for your interactive exhibit (see **Step 4 Getting Your Briefs Out**) and commission an exhibit designer to come up with innovative ideas

But it is important to realise that generating ideas is the easy bit; turning any one of these ideas into an exhibit is a great deal of work. Remember success is 10% inspiration and 90% perspiration while failure is 10% perspiration and 90% aspiration. Put simply you need to do a lot more research, planning and testing to turn your ideas into interactive exhibits.

Step 2: Selecting the *right* ideas
You will inevitably generate more ideas than you could possibly turn into interactive exhibits. Furthermore not every good idea for an exhibit makes a good *interactive* exhibit. So the first question to ask yourself is "Would this idea make a better object-based display, audio-visual presentation, family workshop, book, lecture, etc?"

The best interactive exhibits have the following characteristics:

- Provides the visitor with choice and control over the experience
- Provides a challenge, with clear goals and immediate feedback on performance, that is (just) within the capability of the visitor
- Inspires playfulness among visitors
- Provides an experience that can be shared with other people
- Provides a reward that is beautiful, delightful, wonderful, unique, intrigue – i.e. is not just a lot of text
- Provides an opportunity to make something or achieve something visitors feel is worthwhile
- Are focused on a particular theme, message or experience. Try and avoid the temptation to shoehorn several ideas into one exhibit – this usually creates a confusing mess. It is much better for an exhibit to do one thing very well then several badly.

Will your idea provide these types of experience? If not then an interactive exhibit may not be the right medium.

Just because it is a good idea for an interactive exhibit does not mean that it is the right idea for your project. The next step is to consider a range of other issues when selecting ideas for interactive exhibits.

Suppose you were working on the development of an exhibition and a member of the team proposes an idea for an interactive exhibit. What process will you need to go through to decide whether or not to proceed with the development of this idea? Well you would need to consider all of the following:

- Is this what we really want to do? Does it actually deliver any content and learning outcomes relevant to our project?
- Will the target audience find the activity appealing, accessible, challenging, thought-provoking and rewarding? (I.e. does it have the characteristics listed above)
- Is it possible to build this exhibit?
- Is it possible to build this exhibit within the time and budget we have?
- Is there an exhibit designer available who is willing and able to build this exhibit?
- Can it be made safe and robust enough to display in our exhibition?
- Is there enough space for this exhibit in the exhibition?

A 'no' to any of the above questions should mean that you kill the exhibit idea and reallocate the time and money to other, better ones. You will need to do a lot more research in order to answer these questions.

Cost will inevitably be a major factor in deciding whether you can proceed. It is difficult to make generalisations about how much 'an interactive exhibit' costs as it depends upon its complexity and novelty. However here are some very rough costs for developing different types of exhibit:

Mechanical interactive exhibits (not including housing or maintenance costs)

- Cheapest ~£2,000-£3,000 (very simple)
- Average ~£15,000-£20,000
- More complex (e.g. large scale; complex electronics or mechanisms) ~ £30,000-£80,000

Computer interactive exhibits hardware and software costs (not including housing or maintenance costs)

- Cheapest ~£7,000
- Average ~£10,000-£20,000
- More complex (e.g. novel interfaces; projected images etc) ~ £30,000+

If you have less money you might want to consider buying copies of existing interactive exhibits. This will be considerably cheaper but make sure these exhibits do actually meet your requirements and that they are genuinely appealing, accessible and educational for your target audience. Just because an exhibit is on display somewhere else does not mean it is a good exhibit.

It is also considerably cheaper if you design and build the interactive exhibit using your museum's workshops and software designers. However, remember the reason it is cheaper is because you are not paying for the salaries of these staff – but somebody somewhere will have to cover these costs.

Purchasing exhibits abroad can produce savings although it is harder to manage the development process (see **Step 7 - Managing the Process**). Remember you will have to pay for shipping and import costs plus travel if someone is going to review the exhibits as they are being built.

Of course some types of exhibits can be developed for a great deal less than the above mentioned costs but these are unlikely to be genuinely *interactive* exhibits. Rather they will be simple lift-up flap labels, replica objects or similar.

Step 3: Planning for breakdown – maintenance

Interactive exhibits will breakdown; it is a fact of life. So if you are going to include interactive exhibits in your exhibition you need to plan for on-going maintenance from the earliest stages of development. Here are some handy hints:

- Involve your maintenance team in the specification and development of the interactive exhibits. They will have specialist knowledge that will be useful and they will be more supportive if they feel that they have been involved
- Think about how the maintenance team will gain access to the exhibit once it is installed. If they have to remove the front of the building every time a fuse needs to be changed it is unlikely that your exhibit will be working for long
- Where will the maintenance team source spare parts? Is it a convenient and reliable source?
- How frequently will spare parts be required and how much do they cost? Somebody somewhere needs to build this into their annual budget. Even computer components break and need replacing. These are generally not too expensive (less than £100) but make sure you have someone available (either in house or external) to do this for you.
- Specify robust components – the amount of wear and tear on mechanical components is enormous - far greater than most contractors will anticipate and far higher than what you would require for equipment in other types of location.
- Are the surfaces hard-wearing and easy to clean? Does the colour scheme you have chosen show up embedded dirt? Are the materials compatible with the chemicals used by your cleaning staff?
- Plan for regular servicing: often break-downs and breakages can be anticipated and prevented by regular servicing. For example the calibration on touch-screens is bound to drift over time causing on-screen buttons to become inactive. A planned programme of re-calibrating screens on a regular basis will prevent this from becoming a problem
- Ensure that the maintenance team keeps proper records of the faults that they find, the work that they do and of any changes that they make to the exhibit
- Get the best from the warranty period – ensure that the debugging occurs during the warranty period. Record any error messages that appear on screen and report them to the exhibit designer
- Make sure that your developer gives you the software on a disk together with instructions for installing it. That way when your computer breaks you can get another one and just install the software again.
- For more complex mechanical or computer exhibits make sure you get an operations and maintenance manual. This is a document supplied (often in electronic form) by the exhibit designer specifying how to operate and maintain the exhibit. It is delivered at the end of the project and is often linked to the final payment.

All of this information will get fed into the next stage – the exhibit brief.

Step 4 - Getting your briefs out

Once you have selected an idea that you want to turn into an interactive exhibit the next stage is to write the exhibit brief. It is one of the most important stages in the exhibit development process as it will consolidate and communicate all of the research that you have done and will clearly specify what you want to achieve. There are three sorts of exhibit brief – creative, fabrication and part creative.

Creative briefs are where you – the client - know the learning objectives and content you want to cover but not how these will be achieved. What you are looking for from the exhibit designer are

creative ideas that will deliver your aims and a process for turning these ideas into a working exhibit.

Fabrication briefs are where you – the client - know precisely the content, learning outcomes, the type of exhibit, what it should look like and what experience it should provide for visitors. What you are looking for is someone to build a robust and reliable version of this exhibit at a reasonable cost.

Most exhibit briefs actually lie somewhere in between these two extremes – i.e. **part creative briefs**. In these cases you know in quite a lot of detail what you want to achieve and what form the exhibit will take but there are important parts of the exhibit where you need creative input from an exhibit designer.

Here are the sorts of headings you will typically find in a good exhibit brief:

- Scope of work – what will you be asking the designer to do? What will they need to design *and* build? Will they purchase the hardware? Who will provide text, images etc – you or the designer?
- Exhibit description – what type of exhibit are you looking for; computer, mechanical, electro-mechanical? How much space is available for it?
- Experience for the visitor – what do you want the target audience do and see and why will they find this appealing? How many visitors will use the exhibit at a time? For how long do you hope visitors will, on average, engage with the activity?
- Content priorities – bullet point list of 2 or 3 things which the exhibit absolutely *must* cover
- Content background – 1 or 2 pages of more detailed content to provide the designer with ideas and an over-view of the exhibition of which the exhibit will form part
- Target audience – for whom *must* the exhibit be appealing, accessible and educational? NB ‘everybody’ or ‘the general public’ are too vague, you will need at the very least to specify type of group – school, family, independent adult – and age range of the children
- Learning outcomes – what benefit do you want the target audience to gain from interacting with the exhibit? See the MLA’s Inspiring Learning for All web site for more advice; http://www.inspiringlearningforall.gov.uk
- Design requirements – things which the designer must take into account such as the graphic style and colour palette used in the rest of the exhibition. How many visitors are likely to be using your exhibit in a year? Will the exhibit be in a staff or un-staffed gallery.
- Disability access – worth taking expert advice on this. You should specify what your minimum requirements will be e.g. height and number of screens, wheelchair accessibility, minimum font size. The developer will need to know this **before** they cost and start designing your exhibit
- Technical requirements – specific things that you want the exhibit designer to take account of e.g. lighting requirements; floor loading; sound spillage; the type of software or hardware to use etc.
- Formative evaluation requirements – how many prototype exhibits will you require and what form should they take (see **Step 8 – Testing your ideas with real visitors**).
- Budget – how much money is available to develop the exhibit? For a creative brief you will need to have a fixed budget whereas for a fabrication brief you can use a budget tender process whereby different contractors bid for the work.
- Programme - When will the finished exhibit be required for installation? What are the main stages in the development process and roughly when will they happen?
- How you will select a developer – how do you want the potential exhibit designer to respond to this brief? What particular issues do you want their proposal to address? How will you go about selecting an exhibit designer?

Obviously the amount of detail you need to include depends upon the cost and complexity of the exhibit. The brief for an exhibit costing £2,000 will probably be no more than 1 or 2 pages in length. A brief for an exhibit costing £40,000 is likely to run to 8-10 pages. You will also need to

supply a few pages of background information about the project; the programme for the exhibition's development; your museum's standard terms and conditions of contract; specific contractual requirements for this project e.g. how the payments will be staged and what needs to be delivered for each payment; expected warranty periods etc. For more information about writing exhibit briefs see Joe Cutting's website at http://www.joecutting.com/advice.asp

Step 5 – Thinking about time scales

Like costs it is hard to generalise about how long it will take to develop an interactive exhibit as it depends on how complex it is and whether anything similar has been done before. As a very rough rule of thumb computer exhibits take a minimum 4-5 months from the point of commissioning the designer – longer if it is a complex exhibit. Mechanical exhibits are likely to take a bit longer, roughly a minimum of 5-6 months from the point of commissioning the designer and again longer if it is a more complex exhibit.

You can, of course, often develop interactive exhibits more quickly but the quality will suffer and you are unlikely to get as good value for you money.

Step 6 – Finding an exhibit designer

OK so now you have your exhibit brief the next thing is to choose a designer to develop your exhibit. Depending on the scale of the budget for your exhibits you may need to use different competitive tender processes - it is best to take expert advice on this. As a general rule you must treat everybody the same to ensure fairness. Use the same criteria to judge each exhibit designer and make sure that all of them have the same information so that they all have an equal chance of winning the contract. Keep records of your decision making process and the criteria that you have used for the selection.

Here in broad outline is the sort of thing you will need to do:

- For creative briefs set a budget for each exhibit
- Advertise some general information about the project and type of exhibits you are looking for and invite exhibit designers to send you portfolios of their work
- On the basis of the portfolios you receive draw up a short-list of companies
- Send out the detailed exhibit brief to your short-listed exhibit designers
- Review the proposals returned by the short-listed exhibit designers – NB this should not be on the basis of cost alone; you need to balance cost against the appropriateness of what is proposing
- Select your preferred exhibit designer – make an offer, agree budget and finalise programme; check that they have sufficient turnover and indemnity for the project; finalise, sign and exchange contracts; then get started

Places to look for exhibit designers include:

- The Museum's Journal and the Museum Services Directory published by the Museums Association http://www.museumsassociation.org/
- Trade shows and conferences where exhibit designers promote their services such as the Museums and Heritage show http://www.museumsandheritage.com/
- Heritage 365 website http://www.heritage365.com/
- The British Interactive Group web site at http://www.big.uk.com/
- The European Network of Science Centres and Museums http://www.ecsite.net/new/ and its UK branch Ecsite-UK http://www.ecsite-uk.net
- The Museum's Computer Group at http://www.jiscmail.ac.uk/archives/mcg.html

Step 7 - Managing the process
There is not enough room to describe even the basics of good project management here. However these are a few things you will need to do:

- Pay attention to detail – keep in constant contact with the designer; ask to see what they have done at regular intervals if possible by visiting their studio/workshop in person.
- Agree at the start what information and resources your organisation will provide to the exhibit designer and when you will provide them. Make sure you stick to the agreement otherwise the exhibit will be delayed
- Make sure that the content you want to be covered by the exhibit is actually included.
- Stage payments linked to deliverables – neither wait to the end of the project before paying the exhibit designer nor give them all of the money at the very beginning. Instead break the payments into chunks and link these payments to specific points in the project plan e.g. first payment on commission; second payment on delivery of prototype 1, third payment on deliver of prototype 2 and so on
- There will probably be a 'lead designer' who is in charge of the overall design of the exhibition. The exhibit designer will need to liaise closely with this lead designer to ensure that their exhibit fits into the space and housing provided. Check that this liaison is happening – do not assume it will.
- Have a clear chain of command – be absolutely clear who in your organisation has the right to agree a change in the exhibit's design (i.e. who has sign-off). Ensure that all communication between the museum and the exhibit designer is routed through just one person.
- Maintain written records of meetings, especially the decisions and action points; keep copies of correspondence and emails between the museum and the exhibit designer

The key thing to remember is that the development of an exhibit is shaped by competing forces (for better or worse). In most projects these seem to coalesce around four constituencies:

- Design – the desire for the exhibit to look beautiful, dramatic, fashionable and for it to be built to a high standard
- Visitor needs – the desire for the exhibit to be appealing, accessible and genuinely educational for a realistic target audience
- Innovation – the desire for the project team to take risks and do something original and unique
- Content – the desire for the exhibit to include well researched content, aligned with the broader aims of the exhibition and of the museum

Successful exhibits (and indeed successful exhibitions) are produced when these four forces are in perfect balance with each other - none of them being either too weak or too strong. It is important to ensure that the team includes knowledgeable and experienced advocates for each of these constituencies who are able and willing to argue assertively for their area of expertise. In nearly all cases the best advocates for the content are you the client museum. You have the necessary expertise and are best place to select, write and check the content.

There is more advice on working with exhibit designers on our web sites at http://www.joecutting.com/advice.asp and http://www.bengammon.com/advice.html

Step 8 – Test your ideas with real visitors
We would always strongly advise that you test the designs for your interactive exhibits *during* development on samples of real visitors: this is known as formative evaluation. This can literally save thousands or tens of thousands of pounds as it can prevent mistakes being made in the exhibit's design which lead to it being unusable by visitors. Once an exhibit has been built and installed the chances of being able to change it are vanishingly small since the budget has been spent and the team have dispersed.

There is not enough room to give comprehensive advice on formative evaluation but here are a few points to get you started:

- Test the prototypes on real visitors not members of museum staff. People who work in museums think and act nothing like museum visitors.
- Prototype exhibits need to be partially functional versions of the actual exhibit – paper storyboards or foamex models are not good enough
- Formative evaluation is quick and dirty – you are only seeking to identify major problems not ultra-accurate statistical data. Usually testing the exhibit on 20-30 people provides plenty of data
- Test prototype exhibits by observing at close quarter visitors' use of them, then interview the visitors about what they did, why they did that and what they feel about the exhibit
- Concentrate on evaluating whether visitors can operate the exhibit (and if not where and why do they get stuck); whether they find the activity challenging and appealing; and whether there is any evidence that the learning objectives are being met
- Provide the exhibit designer with a short and concise summary of the problems you have identified and highlight any priority issues they must address.
- Make sure the report is delivered on time – the exhibit development process will not wait for you.
- Do not try and re-design the exhibit yourself; that is the job of the exhibit designer. Point out the problems and ask the designer for creative ideas for overcoming those problems
- Test at least two versions of the prototype exhibit – the changes you agree may not work or may even make matters worse so need to be tested again on real visitors.

For more information about conducting prototype testing see Ben Gammon's web site at http://www.bengammon.com/advice.html

For general advice about designing effective interactive exhibits see Ben Gammon's papers in the Informal Learning Review: www.informallearning.com/archive/1999-1112-a.htm and www.informallearning.com/archive/1999-0910-a.htm

And finally

During the design and development of an interactive exhibit you may need to seek specialist advice (either from in-house experts or from external consultants). These include:

- Health and Safety
- Intellectual property rights, competitive tendering and other contractual issues
- Disability access requirements
- Project management procedure

It is worth starting this consultation process early in the exhibit's development so that you can brief your designer about your requirements before they estimate a cost and start to design your exhibit.

For more information about interactive exhibit development see
www.bengammon.com
www.joecutting.com

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