PAPER

WHAT CAN BE ACHIEVED IN

STANDARDISATION

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It is far better to attempt something great and fail, than attempt nothing and succeed. R.H.SCHULER

1. PRECIS

To date, there is no formal degree of standardisation of gaming equipment requirements between the various Australian jurisdictions. The logistics and cost borne by the manufacturers in maintaining a different product for each market are significant in that costs must be recovered, delays are experienced and inevitably, with a multitude of product variations to control, mistakes are made which can sometimes be both costly and embarrassing for all parties. The foundation of the proposed solution to this problem is "standardisation", which in the context of the gaming industry means much more than common technical requirements.

The objectives of this dissertation are to:

a. Identify the key elements of standardisation and explore how these elements may be instigated and controlled.

b. Conclude with what can be achieved in standardisation.

2. DIFFERING APPROACHES

Before identifying what can be achieved in standardisation in the gaming industry, it is useful to briefly identify what has been achieved in standardisation in industry, generally.

It is also important not to lose sight of the fact that although we are pursuing standardisation in the gaming industry on a National level, "Australia and New Zealand have enviable records in many areas of technological innovation, and their participation in the creation of International Standards has always been significant"[2].

2.1. No Standardisation

Consider the electric plug, developed prior to international standardisation. A simple device which typically requires three pins (Active, Neutral and Ground), however, no form of standard means that up to twelve[2] different types still exist today. Consequently, there is potential for a manufacturer of appliances, say, to produce up to twelve different product variations to service its markets.

If such inconsistency can occur over a simple device such as a plug, it is not difficult to appreciate the diversity between those Australian States and Territories currently operating a far more complex device such as a gaming machine.

2.2. Coping with lack of Standardisation.

Having a monopoly, Henry Ford was able to sell his model T Fords dictating that customers could have any colour as long as it was black. In the open market, however, a single company rarely has such a luxury. In an attempt to satisfy all customer's demands for size, colour, wheel size, etc, National Bicycle Industrial Co. of Japan have opted to accommodate the customer's needs[1]. Using Computer Aided Design and Manufacturing (CAD/CAM) among other high technology approaches, they are able to produce any one of over 11 000 000 possible combinations of bicycles in under 10 days.

Given the current manufacturing systems employed by the various machine manufacturers, and the need to regulate certain aspects of a gaming machine, this approach is not considered to be a viable option.

2.3. Dictating the Technology

There is a single international standard addressing the compact disc ensuring universal compatibility. With a standard technology, companies compete in the global market by marketing the product rather than the technology. Given the standard technology there can be no question as to the variety of music or artwork on the CD covers.

If one makes a simple analogy of a song as the game chip, and the CD cover as the machine cabinet/artwork there is the potential precedent for a common gaming machine hardware platform. However, gaming machine manufacturers are resolute on being given the ability to make their own commercial decisions about diversity. Consequently, regulating commonality by specifying identical EGM hardware, for example, would not appear to be a viable option.

2.4. Industry Co-operation (self-standardisation)

Consider the situation where companies are producing many different products for different markets and that the associated cost precludes the companies from expanding large scale into other markets. Theory tells us that "a firm will tend to expand until the costs of organising an extra transaction within the firm become equal to the costs of carrying out the same transaction on the open market or the costs of organising in another firm"[3]. Consequently, it is not uncommon for Japanese companies to adopt an approach whereby the technology of companies is pooled in a joint venture, to enable the companies to expand into new markets. The technology is "self-standardised", and the firms simply compete through marketing aesthetics or brand-names.

The gaming industry has a reputation of being quite volatile, and it is unlikely that manufacturers would be willing to co-operate to the extent that they pool their technology. Of some encouragement, however, is the recent formation of the "Australian Gaming Machine Manufacturer's Association" (AGGMA). One of AGGMA's charters is to attempt to achieve industry standardisation on certain issues. Whilst little headway has been made in this regard, some co-operation is occurring on issues such as tower light signals. Where there are no regulatory requirements covering an aspect of a gaming device, the manufacturer's should be

attempting to standardise, thereby placing themselves in a position where they may dictate certain issues to the market, rather than having to provide a different product variation for each customer.

2.5. Precedent

No precedent for standardisation of technical requirements for gaming equipment can be located, however, Mr John Henry from Standards Australia was approached for precedent of a standard where the following criteria applied:

a. Different jurisdictions having different legislative requirements.

b. Those requirements were in force for some time.

c. The subject was rather political and high profile.

To quote from Mr Henry's reply:

"There are countless examples of the type of problem you face and even when a national Standard has been developed it is often enforced differently in different States. Mutual recognition should, in theory, remove interstate barriers to harmonisation but, it is untested in the courts."

He then proceeds to quote some examples, with the following qualification: "I would have to say that in most cases a few lingering variations in the regulations remain even though the exercise has been largely successful."

AS 1742 Road Signs

AS 1698 Motor Cycle Helmets

AS 2063.2 Bicycle Helmets

AS 2898.2 Code of Practice for use of speed radar by Police and others.

3. A QUESTION OF BALANCE

It may be rather optimistic to suggest every State will be adopting "Standard X" for Gaming Equipment which applies to all aspects of gaming equipment. Rather, it is suggested that what can be achieved is not complete, but a significant degree of standardisation.

It is not considered feasible to mandate a technological solution as the only solution, nor is it considered feasible to expect the machine manufacturers to continue to be capable of providing at least one (sometimes

up to three) different "compliant" products to each jurisdiction within Australasia (bearing in mind that the customers within these jurisdictions may request further variations of any compliant product).

Finally, a documented standard on its own is of little value unless reasonable controls and procedures are put in place to ensure that the standard is used and that benefits flow on to the industry. Consequently, there are a number of key elements for success.

4. IDENTIFICATION OF KEY ELEMENTS OF SUCCESS

The key elements in achieving the "balance" required for standardisation are discussed below.

4.1. Objectives

Each jurisdiction should be clear on the objectives it wishes to realise through the enforcement of legislative and technical requirements for gaming machine technology. These objectives will be similar if not identical from jurisdiction to jurisdiction.

4.2. Risk Assessment

Once the objectives are known, one can then assess the risks involved with each of these objectives and determine which areas of the Gaming industry or Gaming Equipment need to be controlled to minimise the risk. For example, a paper presented by the Author at the 1993 National Association for Gambling Studies Conference entitled, "Socially Responsible Introduction of Gaming Machine Technology" identified some key risk areas of game software design which can greatly influence the "fairness" of a device.

When the areas of risk have been identified it is necessary to determine the appropriate place for any control requirements to be specified. That is; Act, Regulations, Technical Requirements Document, for example. Such identification and placement would appear to have already been accomplished by those jurisdictions operating gaming equipment, in that a subject's location in a given document is fairly consistent. However, the specific requirements relating to a given subject would indicate varying degrees of the assessment of risk.

4.3. Legislation

As previously implied, there is already a good deal of commonality between legislative requirements of jurisdictions insofar as the requirement to have gaming equipment evaluated is concerned. For example, the following legislation was reviewed and all have the common element that the Director must approve gaming machines.

- Queensland Gaming Machine Act, 1991. - Part 6.17
- Queensland Casino Control Act, 1982. - Part 62

- Victorian Gaming Machine Control Act, 1991. - Part 69
- Victorian Casino Control Act, 1991. - Part 62
- (Nevada Legislation, Supplement 19-1-93Part - 9:46-1.28)

Some refer specifically to "gaming machines" whilst others make a broader reference to "gaming equipment", some explain the process of approval, whilst others do not detail the specifics of the process. Further, there are inconstancies pertaining to what happens after approval; gaming equipment delivered and operated to be in accordance with approved devices, for example.

Time constraints did not permit a full review of all jurisdiction's legislation at this time, so it is assumed that despite some inconsistencies between various jurisdiction's legislation, all legislation is at least consistent in the fact that "the Director must approve...". Given this assumption and that the fact that all jurisdictions update their technical requirements documents without the necessity for a review of Legislation or supporting Regulations; no modification of legislation or regulations is considered necessary to accommodate modification to technical requirements to provide consistency between jurisdictions.

4.4. Regulations

Regulations also are generically similar between the various jurisdictions in that they cover similar issues such as restricted components, penalty rates, fees, prescribed forms, etc.

Perhaps the only major and obvious difference in regulations at this time would be the approach Victoria has taken with the Gaming Machine Monitoring and Control Regulations, associated with the Victorian Gaming Machine Control Act, 1991. It is suggested that the Monitoring and Control Regulations currently address issues which have the potential to be addressed in a technical requirements document. Consequently, there appears to be no major reason why Regulations cannot be made relatively consistent between jurisdictions; at least with respect to Gaming Equipment.

Finally, as discussed elsewhere in this paper, co-operation and sharing of information is an important aspect of adopting a standard approach to a standard document(s). Significantly, regulations typically list most other jurisdictions within Australia, New Zealand, and a handful in the U.S.A. Consequently, there would appear to be no legal obstacle to jurisdictions co-operating. There may be some dilemma, however, if information obtained by a government body was passed onto a private laboratory and therefore, adequate controls would need to be placed on such a private testing facility (perhaps legislated) to ensure the probity of the testing organisation and its staff. This could take the form of licensing, independent audits by the jurisdiction, and prohibiting direct business and financial relationships with manufacturers and operators, for example.

4.5. Standard Technical Requirements

If you copy from one author is plagiarism; if you copy from many its research. Wilson Mizner

It is suggested that technical requirement documents are well researched. As such there already exists a common base from which to work, from which to develop a "Minimum Regulatory Requirements for Gaming Equipment Standard".

A suggested methodology for establishing this fundamental element in achieving standardisation is discussed:

4.5.1. STEP 1 - Ownership, Control, Participation and Funding

With reference to Section 5.10 below, the mechanism through which the standardisation process shall be driven must be decided. Additionally, whether significant participation is to be purely voluntary or funded (and the method of funding) are matters to be resolved.

4.5.2. STEP 2 - Scope of the Standard

Achieve consensus on the scope of a Standard. At the very least, it is suggested that the document should attempt to achieve consistency in the following areas:

1. Ownership of the document

2. Format of the document - refer acceptance of previous testing 5.14

3. Terminology

4. Format and manner in which manufacturers are to make submissions

5. Minimum Requirements for gaming equipment which are common to all jurisdictions.

6. Equipment and other information to be provided

7. Warning of requirements which are under consideration for standardisation. This may mean future compliance in markets not currently mandating a requirement, or removal of a requirement from other markets.

8. A standard indemnity agreement

9. A standard non-disclosure agreement

10. Procedural matters such as how to go about a formal request for a transfer of approval.

4.5.3. STEP 3 - Title of Standard

Once the scope has been agreed to an appropriate title, indicative of the scope, may be established.

4.5.4. STEP 4 - Document Format

It is the authors opinion that the document format must be designed to facilitate both the manufacturer's development and the testers testing. In order to achieve this, it is suggested that the document be separated:

> Firstly into what is required of the manufacturer, the operator, and the site - both procedural and technically.
>
> Secondly, into groupings in accordance with the modular design of equipment hardware, software, mathematics, artwork, etc. Such groupings would be conducive to both development (in that an engineering manager simply gives the appropriate sections of the document to the appropriate design people for a given project), and testing (Refer Sections 4.14 and 4.15).

Regardless of the above, it is recommended that both Government and private industry are consulted for advice on the 'preferred' format.

4.5.5. STEP 5 - Document Contents

The Oxford Dictionary defines a Standard as: "A specimen or specification by which the qualities required of something may be tested."

It is suggested that the next step be to identify what terminology, what required qualities, what methodologies, etc. are common between the existing documents of various jurisdictions.

This commonality will form the basis for the standard.

At this time the following should also be identified:

1. Slight differences

2. Commonality between some jurisdictions but not others

3. Significant differences

4.5.6. STEP 6 - Issue Draft Standard for Industry Review

At this stage, a draft standard may be issued to all interested parties for comment. However, as consensus will have been reached in STEP 1 to 4, and the draft standard will not be introducing any new approaches or requirements, no major objection is anticipated. From the author's review of various documents from time-to-time, it has been observed that there a great many objectives in common, although the wording may be

slightly different. The only potential problem anticipated at this stage may arise because standard wording must be adopted.

It is important at this stage to bear the following in mind[8]: "Australian Standards, although technical in content, are often used in commercial agreements between third parties and maybe used in legislation at both State and Federal levels. Standards may also be subject to the scrutiny of the courts. For these reasons, Standards should be drafted in a clear manner, avoiding ambiguity."

4.5.7. STEP 7 -Publish Standard and Modify Existing Technical Requirements Documents

Participating Jurisdictions may decide to remove all common requirements from their existing documents and refer to the standard document, whilst still enforcing their own specific requirements.

4.5.8. STEP 8 -Resolution of Differences

The unresolved issues identified in step 5, must be attempted to be resolved. That is; slight differences, commonality between some jurisdictions but not others, and significant differences.

An assessment of risk is considered an important prerequisite to justifying any technical requirement. Some jurisdiction's requirements may not be seen to be adequate, whilst others are too restrictive. This may prove to be because the risk involved and potential compensating controls which could be applied to minimise the risk have not been adequately considered.

Of course, not all differences will be able to be resolved. The different communications requirements of different jurisdictions is perhaps the most significant example (though fundamentals such as encryption, and error checking could still apply).

Standards Australia offer the following guideline[8]: "No standard should be published if it is recognised that there is significant interest opposed to its publication. This is not to say that unjustified views of any given party motivated by self-interest should be accommodated."

4.6. Acceptance of Standard Technical Requirements

A key element in the success of standardisation is the acceptance of standard technical requirements and associated standard approaches by participating jurisdictions. However, at least one head of department has indicated a reluctance to participate in or support any form of standardisation, based on what the author has assessed as a legitimate fear of loosing control.

It is reasonable to assume that from time to time an issue may arise in a particular jurisdiction which has not previously been considered. Consequently, that jurisdiction must have the ability to deviate from the standard or issue a new requirement. Subsequently, a number of scenarios are possible, and appropriate

measures should be in place to accommodate these. For example, an amendment to the standard may be decided to be appropriate, or that jurisdiction may realise that its immediate reaction was not the most appropriate course of action and that the objective is better realised by a compensating control (it all gets back to assessment of risk).

It is worthwhile noting that whilst standardisation is a goal to be reached and some of the processes in realising a published Australian Standard are discussed in this paper, the standard need not take the form of an Australian Standard. That is, any standard could simply be accepted on the basis of a memorandum of understanding between the various jurisdictions.

Furthermore, if an Australian Standard were the preferred approach, it must be clarified that because Standards Australia is NOT a government body, its standards are not legal documents in themselves unless governments call them up in legislation.

Consequently, Australian Standard or not, there need not be a legal obligation, but at least a basis for co-operation and acceptance of the "standard" by participating jurisdictions.

4.7. Standard Approach to Invoicing for Testing

Currently Qld, NSW, and Victorian Legislation precludes any person who is an officer of the government regulatory body or an organisation such as a testing authority from having a direct business or financial relationship with an organisation such as a machine manufacturer. Consequently, it is the practice at least for private laboratories in Victoria, for the test-lab to invoice the Government and the Government to audit these invoices before passing them on to manufacturers.

However, this may not be the case with some overseas testing laboratories. It is the author's understanding that some Australian jurisdictions are contemplating having private labs do the same. If such were to occur the Victorian, Queensland and New South Wales Laboratories would be excluded from co-operating with those States.

To quote Block[4] "Advocates of market self-regulation believe that if individuals have maximal freedom in the making of their microeconomic choices, the aggregate result will be rational; there is no need for any centralised mechanism for making choices." However, this "...ignores the inevitability of institutional arrangements that will structure microeconomic choices".

In assessing the relationships laboratories have with manufacturers of equipment it is important to observe that the organisation who values a testing laboratories service the most does not pay, whilst the organisations who value it the least are the ones who must pay.

In other test environments, the organisation who pays for the testing service can either accept or reject the advice of their testing consultants, and may reject the advice in order to have a product ready in time for a customer.

Where an organisation is faced with no option but to comply, there is the potential for that organisation to place pressure on the testing laboratory. Clearly, if a manufacturer were allowed to choose who they wanted to do the testing, and then pay that laboratory directly, it would not be to their commercial advantage to choose a laboratory who failed their products.

Where the market is controlled by the government as the client and manufacturers as stakeholders, there is incentive for the tester to offer the best service, with time and cost being secondary. However, where the market is controlled by manufacturers who effectively become clients and self-regulation is relied upon, there is a danger that a laboratory could place time and cost first, at the expense of quality of service in order to gain a dominant position in the market place.

It is therefore recommended that jurisdictions adopt a consistent approach to enforcing a relationship between laboratories and the suppliers of gaming equipment. It is further recommended that this approach be consistent with Victoria, Queensland and New South Wales.

4.8. Co-operation between Testing Laboratories

Following from 5.7 above, and the discussion on co-operation in 5.4 above. It is quite clear that those jurisdiction who employ testing agencies who deal directly with manufacturers would be excluded from any co-operative agreement between those that do not.

That is, those jurisdictions relying on self-regulation, whilst complying to a standard would be isolated insofar as utilising the mechanisms to achieve a benefit from standardisation. For example, it is unlikely that a fully accountable laboratory would be permitted to provide information of previous approvals or known cheating practices to a private laboratory who dealt directly with manufacturers.

Having said that, if all jurisdictions are consistent in the controls they place on their testing laboratories, then a basis for co-operation should exist. That is, with due consideration to protection of intellectual property, information on an aspect of a submission which has been approved by a lab as complying to a part of a standard, could be provided to another lab, for the purposes of reconciliation with a submission (see 5.14, Acceptance of Previous Testing, below).

4.9. Private or Government Controlled Testing Laboratories

For reasons discussed above in 5.7, a private laboratory which relies on self-regulation is not recommended. However, a government laboratory which has established government policies to create barriers to entry by competitors and thus create a monopolistic situation also has its drawbacks.

A competitive environment drives a testing agency to be aware of quality of service, pricing, and speed of service offered. There is incentive for continual improvement and co-operation rather than the potential for being complacent and unyielding. Nevertheless, provided a constant approach to regulating the actions of testing laboratories and mechanisms for co-operation are put in place, it is suggested that the ownership of a testing laboratory does not present an obstacle to standardisation.

4.10. Agreement of Control and Participation

The following are observations adopted from AS748[8]:

1. All those who are sufficiently interested should be able to have their views considered while the "Standard" is being prepared.

2. Participation should be meaningful and the process should be responsive to diverse inputs without undue influence by any single interest.

3. The Standard should not act as a barrier to innovative development, or restrain competition or trade.

4. The content of a Standard is the responsibility of a technical committee, and Australian Standards are prepared by consensus of all interests on that committee.

5. Individuals who serve on technical committees are representatives of sectors of interest and would normally have been nominated by government bodies, user organisations or professional or trade associations.

6. Committees may set up executive committees, subcommittees and working groups on an ad hoc basis to assist them in their work, but such subcommittees and working groups have no independent status.

To this end, agreement should be reached on what organisation, association, or otherwise will be the focal point of all standards issues. Further, the extent of participation by interest groups and the allocation of work on a voluntary basis or otherwise are matters for definition.

It is not recommended that a single testing laboratory or jurisdiction control the entire process. Rather, it is recommended that the controlling body constitute representatives from all interest groups, and have significant government control.

Two options are suggested:

1. Form a Standards Australia Technical Committee.

   Some points to be considered:

- Previous experience in driving a standard.
- Previous experience in dealing with and resolving controversial issues associated with the standards process.
- Established basis for National and International Recognition.
- "The copyright of all Australian Standards is vested in Standards Australia"[8], however, each jurisdiction currently retains copyright over its own documents.

8. Form an "Australian Gaming Association", with a charter to focus on National Issues - chaired by a member of an independent gaming commission or head of a government department . From this base, adopt the basic approach outlined in Section 5.5, and develop sub-committees (who may constitute testing laboratories, licensing authorities, manufacturers, casino operators, etc.) to also investigate ancillary issues raised in this paper.

   Some points to be considered:

   - The Association would own the document.
   - The Association would control and drive the process.
   - The Association could hand the process over to Standards Australia to drive once the foundation work had been completed (ownership would, however, be lost).
   - The Association could hand the Standard issue over to Standards Australia to drive, but retain control of the ancillary issues.

4.11. Common Approach to Assessing What Constitutes a "Quality Job".

With an appreciation of what an evaluation entails, one can appreciate, what constitutes a quality job.

Let us consider that software is deemed to be reliable if it complies with a published set of technical requirements and does not malfunction - the result of which may result in non-compliance.

"Between one-third and one-half of the effort that goes into the development and maintenance of a software system is spent on testing and debugging...If, in addition, the indirect costs of errors are considered, then the economic significance of software reliability becomes even more pronounced."[5]

"Even with simple programs only a vanishingly small part of all theoretically possible input cases can be exercised during the test phase...A program has only 3 inputs each of 16 bits and requires 100micro-seconds of CPU for the computation. A complete test of all possible input cases (2^{48}) would require approximately

900 years of CPU time...in practice only 100 input cases may be tested...but the program will encounter only a fraction of all inputs during its operational life."[6]

Consequently, to do the job properly, a testing laboratory must utilise an optimum strategy to optimise the time and cost of testing against the scope of testing.

Another element which tends not to be widely appreciated is inherent in the question; "Can it really take that long to evaluate a few lines of changed code." By way of example, Wolverton and Schick[7] present statistics which indicate the following:

Number of instructions changed	Probability that a change is correct at first attempt.
1	40%
10	37%
15	24%
40	22%
50	16%

A marketing professionals may label a laboratory as "slow and expensive", whilst an Information Technology professional may label the same laboratory as thorough and cost effective. Nevertheless, as previously mentioned, competition will ensure that laboratories are always striving to achieve maximum cost and time efficiencies, but not at the expense of quality.

4.12. Methodologies

Without question another key element in obtaining benefits from testing a product to a standard, is a common approach by evaluation laboratories and authorities to issues such as:

1. Transfer of approvals

2. Facility for verification and use of approvals given to gaming equipment when the equipment has been approved by a different evaluation laboratory.

3. Facility for request and sharing of information.

However, there may be some difficulty encountered in insisting laboratories fully disclose their methodologies for actual testing to other laboratories. For example, following from 5.11 above, TST is in the process of patenting an optimum strategy used in assessing risk and applying this strategy to the testing methodology using automated processes. This approach has been confidentially revealed to some

jurisdictions in part, but it is intellectual property of TST, which is designed to assist TST in gaining a competitive advantage in the market-place. It is suggested that Queensland M.G.D., N.S.W. L.A.B. and B.M.M. adopt different approaches and also have intellectual property that they believe provides them with an advantage over their 'competitors'.

If a laboratory to be fully accountable, any and all such processes may be required to be revealed in confidence to government authorities for the purposes of making an assessment of the quality of service being offered. However, it should be sufficient for a laboratory to accept in good faith the assessment of another laboratory on the "role".

4.13. Role of Recognised Testing Agencies

Most jurisdictions employ a "Role of Recognised Suppliers" and certain criteria must be met to be placed on this role.

Accordingly, the concept of a National "Role of Recognised Gaming Equipment Testing Agencies" could be explored, whereby an organisation would not be eligible to be listed on the role unless certain criteria such as quality of service, probity, industry relationships, etc (as detailed previously) are met.

4.14. Acceptance of previous testing

Standard requirements enables testing undertaken for a particular jurisdiction to be accepted by another jurisdiction. The suggested criteria to make this feasible are:

1. Standard requirements (refer 4.5)

2. Participating Laboratories to be listed on the Role (refer 4.13)

3. Co-operation between Testing Laboratories (Refer 4.8)

4. As part of a submission the manufacturer indicates which aspects of their submission been previously approved in accordance with what section of the Standard and by whom.

How the acceptance process may work is illustrated by way of a few examples:

1) Theoretical Return

Manufacturer X submits a game to Tester-1 stating that the theoretical return has been verified by Tester-2. Tester-1 should only need to approach Tester-2 for a copy of the combination and reel strip lay-out sheets, as submitted by X, which has been evaluated and approved by Tester-2. Once this was received, Tester-1 would simply reconcile the information provided by Tester-2 against the

software module containing pay-table information for that game. If they matched, no evaluation of the theoretical return would be necessary and Tester-1 would accept Tester-2 approval of the return.

2) Software

Manufacturer X submits a game to Tester-1 stating that the software has been verified by the Tester-3. Tester-1 should only need to approach Tester-3 for a copy of the software, as submitted by X, which has been evaluated and approved by Tester-3. Once this was received, Tester-1 would simply undertake a file comparison of the software provided by Tester-3 against the software submitted to Tester-1 by X. Where modules matched, no examination of source code would be necessary (there are some exceptions), and where modules differed only the differences and associated routines should be scrutinised. Once a code examination was complete, additional requirements of the jurisdiction for which the submission is being made would be tested. Also the standard requirements applicable to those modules which have been changed should also be tested at the discretion of the tester. There are also a number of other minor tests which could be undertaken in relation to interrupts and timing. Please note that unless the software is modular, the differences identified in a simple code compare may be rather difficult to follow.

3) Hardware

Manufacturer X submits a machine with a printer to Tester-1 stating that the printer has been approved on another machine base by Tester-2, and the new machine base has been approved by Tester-3. Tester-1 should firstly approach Tester-2 and physically inspect the printer and design documents (which have been evaluated and approved by Tester-2) to reconcile with what has been submitted by X. Secondly, Tester-1 should approach Tester-3 and physically inspect the gaming machine cabinet and design documents (which have been evaluated and approved by Tester-3) to reconcile with what has been submitted by X. If both comparisons are satisfactory, the only hardware evaluation necessary may be to test the interface between the printer and machine, the routing of cables, and modified artwork.

Some agreement will need to be reached on an optimum approach, as it could eventuate that a full evaluation could be less costly (though take longer to complete) than the comparison process (if cost of travel is a consideration).

4.15. Transfers of Approvals

It has been suggested previously that the likely-hood of an all encompassing standard, covering every aspect of gaming equipment being accepted, is remote. For this reason, it is unlikely that an approval of a complete device issued in one jurisdiction, could be transferred to another jurisdiction.

However, if one were to treat a gaming machine approval, for example, as the summation of a series of separate approvals of the various modules within a gaming machine then the transfer of these module approvals is conceivable (refer 4.15, above).

5. CONCLUSION - WHAT CAN BE ACHIEVED IN STANDARDISATION

It is pointless having a documented standard if no residual benefits flow on to the industry. Consequently, what can be achieved must be two-fold:

1. Agreement on standard technical requirements for gaming equipment;

2. Agreement on controls, procedures, and co-operative measures to ensure that the benefits are obtained from standard technical requirements.

It is suggested that what can be acheived is not complete, but a significant degree of standardisation (Section 3).

If each jurisdiction is clear on the objectives it wishes to realise (Section 4.1), then an assessment of the risks involved with each of these objectives would reveal which aspects of the gaming industry or gaming equipment need to be controlled to minimise the risk. Inherent in existing jurisdictional requirements is usually agreement on identification of risk, but with varying degrees of the assessment and control thereof (Section 4.2). This applies to Legislation, Regulations and more significantly, Technical Requirements.

Nevertheless what can be acheived in standardisation follows:

1) It would appear that their is sufficient consistency in legislation to accommodate the adoption of a standard document, however, there is scope to make legislation more consistent in relation to the approval process (Section 4.3).

2) Further consistency in supporting regulations can also be achieved to facilitate standard requirements and co-operation (Section 4.4).

3) *If you copy from one author is plagiarism; if you copy from many its research.* Wilson Mizner

It is suggested that technical requirement documents are well researched. As such there already exists a common base from which to work, from which to develop a "Minimum Regulatory Requirements for Gaming Equipment Standard". The development of such a standard can be acheived through an eight step process:

a) Determine ownership, control, participation and funding (4.5.1).

b) Achieve consensus on the scope of a Standard (4.5.2).

c) Decide on an appropriate title, indicative of the scope (4.5.3).

d) Establish a document format conducive to both the manufacturer's development and the testers testing (4.5.4)

e) Identify what terminology, what required qualities, what methodologies, etc. are common between the existing documents of various jurisdictions and hence, what are not (4.5.5).

f) Issue draft standard for industry review (4.5.6).

g) Publish the standard and modify existing technical requirements documents (4.5.7).

h) Resolve differences identified in step 5 through an assessment of risk and possible compensating controls (4.5.8).

4) Jurisdictions can control the use of a Standard. Standardisation can be achieved without a legal obligation to conform, provided there exists a basis for co-operation between participating jurisdictions (Section 5.6).

5) Jurisdictions can achieve a standard approach to enforcing a relationship between private laboratories and the suppliers of gaming equipment. Particularly in relation to invoicing. It is recommended that this approach be consistent with Victoria. This standard approach is a necessary pre-requisite to ensuring co-operation. That is, no private testing laboratories would be excluded from receiving information from a Government testing organisation, such as New South Wales LAB (Section 5.7).

6) If all jurisdictions are consistent in the controls they place on their testing laboratories, then co-operation between Laboratories can be achieved (Section 4.8).

7) A competitive environment drives a testing agency to be aware of quality of service, pricing, and speed of service offered. There is incentive for continual improvement and co-operation. However, standardisation can be achieved using either private or government laboratories (Section 4.9).

8) The establishment of an organisation or committee to drive all aspects of the standardisation process can be achieved (Section 4.10).

9) A standard approach for governments to assess what constitutes a "quality" job can be achieved (Section 4.11).

10) Standard methodologies related to "Standards issues" can be achieved, but complete standardisation of testing methodologies may not be feasible (Section 4.12).

11) To facilitate transfers of approvals and the like, a "Role of Recognised Testing Agencies", with standard requirements for inclusion, can be achieved (Section 4.13).

12) Acceptance of previous testing by 'other' testing laboratories can be achieved (Section 4.14).

13) An approval of a complete device issued in one jurisdiction, can not be transferred to another jurisdiction. However, a standard approach to the transfer of module approvals is achievable (Section 4.15).

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