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The Singapore Electronic Transactions Act 1998 and the Proposed Article 2B of the Uniform Commercial Code

ANDREW PHANG¹ AND DANIEL SENG²

1 Introduction

It is axiomatic that the law must change with the times. And nowhere is this more starkly demonstrated than in the shift, particularly during the last decade or so, into the information age – a shift that has radically changed the face of commerce, and will continue to do so in the years to come. In the context of commercial law, the focus on goods and property, so prevalent particularly in the middle of this century, is now giving way to an acknowledgment that the relevant legal regimes must accommodate information as contractual subject-matter. In this regard, it is widely acknowledged (and correctly at that) that the legal regimes in virtually all countries are unsuitable and need to be at least modified – or even radically

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changed – in order to meet the needs of the information and technological age.³

The proposed Article 2B of the Uniform Commercial Code⁴ embodies the American endeavour in this direction.⁵ And it comes as no surprise that Article 2B is relatively complex and extremely comprehensive, given the highly developed state of information and information technology in America as well as the already existing provisions embodied in the Uniform Commercial Code itself. The proposed Article 2B attempts, however, to deal with *contracts*, as opposed to property, although some (or even substantial) overlap is obviously possible. The focus, in other words (and as already alluded to above), is on *information* or, rather, the *licensing* thereof. Indeed, Professor Raymond Nimmer, Reporter of the committee to revise Article 2B, observes that '[i]n Article 2B, the paradigm contract is a license';⁶ he proceeds to further observe thus:

A license is not a lease and it is not a sale. Both of these terms apply to transfers of *goods*, not rights in information. In leases and sales, the transferee's primary purpose is to acquire goods. In a license, the transferee desires the information and its use.⁷

Singapore, on the other hand, whilst equally passionate about pursuing (and, therefore, dealing legally with) commerce in the technological context has recently enacted a much more modest statute – the Electronic Transactions Act 1998.⁸ This Act derives, in the main, from both the UNCITRAL Model Law on Electronic Commerce as well as the

³ See generally e.g. R.T. Nimmer and P. Krauthouse, 'Electronic Commerce: New Paradigms in Information Law' (1995) 31 *Idaho L. Rev.* 937 and, by the same authors, 'Information as a Commodity: New Imperatives of Commercial Law' (1992) 55 *Law and Contemporary Problems* 103 as well as R.T. Nimmer, 'Article 2B: An Introduction' (1997) 15 *John Marshall Journal of Computer & Information Law* 211 and, by the same author, 'Uniform Codification of Commercial Contract Law' (1992) 18 *Rutgers Computer & Technology LJ* 465. Reference may also be made to D.A. Rice, 'Digital Information as Property and Produce: UCC Article 2B' (1997) 22 *Univ. Dayton L. Rev.* 621 and, by the same author, 'Lessons About the Realities of Contract for UCC Article 2 Revision and a Future Software Contract Statute' (1992) 18 *Rutgers Computer & Technology LJ* 499; as well as R. Salleé, 'The Perpetuation of Litigation Within the Commercial Industry: Soon Brought to a Screaming Halt' (1997) 15 *John Marshall Journal of Computer & Information Law* 421.

⁴ Hereinafter the 'UCC'. The short title of Article 2B is 'The Uniform Commercial Code—Software Contracts and Licenses of Information'; see § 2B-101. For good background, see R.T. Nimmer, D.A. Cohn and E. Kirsch, 'License Contracts Under Article 2 of the Uniform Commercial Code: A Proposal' (1993) 19 *Rutgers Computer & Technology LJ* 281.

It should be noted that references here are to the latest available draft (dated 1 August 1998). In this regard, the literature in the area may refer to provisions that have been since modified in the fast-developing area of the law; however, the relative 'youth' of the provision and the consequent dearth of literature ensure the overall benefits of this literature which, for the most part in any event, capture the principal difficulties, both theoretical and practical.

⁵ See also many of the articles cited at note 3, above.

⁶ See Nimmer, 'Article 2B: An Introduction', above, note 3 at 216. And see the definition of 'license' in § 2B-102(28).

⁷ See Nimmer, 'Article 2B: An Introduction', above, note 3 at 216 (emphasis in the original text).

⁸ No 25 of 1998; hereinafter referred to as the 'ETA'.

Illinois Electronic Commerce Security and Utah Digital Signature Acts.⁹ In many ways, therefore, any comparison of the Singapore ETA with the proposed Article 2B is, in effect, also a comparison between the UNCITRAL Model Law and the US State legislation just mentioned with Article 2B itself.

This article sets out, in very broad terms, a few comparative comments as well as issues with respect to both Article 2B and the Singapore ETA. Constraints of space dictate a rather broadsweep approach. What is clear, however, is that each adopts a quite different approach toward the legal governance of electronic commerce, and this is the first issue to which our attention must now turn. Before proceeding to do so, however, a preliminary point should be noted. As we shall see, the Singapore ETA only touches, if at all, on issues pertaining to the *formation* of electronic contracts. As the law now stands, therefore, other contractual issues are governed, in the main at least, by the existing Singapore common law of contract. Part of this article in fact explores the differences (as well as similarities, where applicable) between the Singapore common law and the salient provisions of Article 2B. This is of obvious comparative interest. On a practical level, however, it should be noted that because Singapore does *not*, unlike the situation in America, *already* have the equivalent of Article 2 of the UCC¹⁰ as part of its statute book,¹¹ it might well be the case that any reform in the Singapore context (even if it is premised upon the approach adopted by the proposed Article 2B) might not be as comprehensive as the provisions of Article 2B themselves, simply because Singapore might decide to allow the existing common law to govern many aspects with respect to electronic contracts – particularly where the salient provisions of Article 2B merely replicate those embodied within Article 2 itself. There is, however, no reason in principle why it might not also adopt many of the provisions of Article 2B as a substitute for the salient existing common law principles. An examination of this particular issue is obviously beyond the scope of the present article, although it is hoped that some parts of this article (which deal with only certain selected areas of general contract law) might give the reader some idea as to how the legal reform authorities in Singapore might proceed should further reform of the law in this sphere be considered desirable.

⁹ For a Comparative Table of Provisions, see the last portion of the Electronic Transactions Bill (*Singapore Government Gazette Bills Supplement*, Notification No B23, 2 June 1998).

¹⁰ Dealing with sales.

¹¹ It is true that the English Sale of Goods Act 1979 (as amended) is presently part of Singapore law by virtue of the (Singapore) Application of English Law Act (Cap 7A, 1994 Rev Ed, Statutes of the Republic of Singapore): see the local reprint of the 1979 English Act (now found in Cap 393, 1994 Rev Ed, Statutes of the Republic of Singapore). It should be noted, however, that the Sale of Goods Act is not as comprehensive as Article 2 of the UCC, although its provisions would presumably be applied either in substitution for (or modification of) the existing common law principles, where relevant.

2 The Respective Approaches Towards the Legal Governance of Electronic Commerce

2.1 *On Contract Law Generally*

2.1.1 *Scope of the Legislation*

The proposed Article 2B attempts, as already mentioned, to govern, as far as is necessary and possible, the contractual regime for software transactions and licences of information in an holistic fashion.¹² In contrast, the Singapore ETA only touches on issues broadly pertaining to the formation of electronic contracts, and even then, does so in a very brief (and, arguably, even ambiguous) fashion. To take one instance, s 11 of the ETA¹³ appears to be merely clarificatory and does not appear to impact on the substantive common law of contract that is part of Singapore law;¹⁴ it reads as follows:

- (1) For the avoidance of doubt, it is declared that in the context of the formation of contracts, unless otherwise agreed by the parties, an offer and the acceptance of an offer may be expressed by means of electronic records.¹⁵
- (2) Where an electronic record is used in the formation of a contract, that contract shall not be denied validity or enforceability on the sole ground that an electronic record was used for that purpose.

Section 12 of the ETA¹⁶ is no more illuminating, for although it is concerned with the effectiveness of ‘a declaration of intent or other statement’ between the contracting parties, it merely states (in similar vein to s 11) that such declaration or statement ‘shall not be denied legal effect, validity or enforceability solely on the ground that it is used in the form of an electronic record’. The rest of that Part of the ETA (Part IV, entitled ‘Electronic Contracts’) does not really appear to deal with the substantive law as such, although there are pockets of provisions that suggest otherwise. This could possibly be attributed to the parentage of the contract law provisions in the ETA – the UNCITRAL Model Law on Electronic Commerce – which was never envisaged to be a codification of the substantive laws governing electronic transactions. Instead, the goals of the UNCITRAL Model Law on Electronic Commerce are more modest. As the Guide to Enactment of the UNCITRAL Model Law on Electronic Commerce explains:

¹² See the Introduction, Reporter’s notes to the Uniform Commercial Code, Article 2B: Software Contracts and Licenses of Information.

¹³ See s 11 of the UNCITRAL Model Law.

¹⁴ See generally A.B.L. Phang, *Cheshire, Fifoot and Furmston’s Law of Contract – Second Singapore and Malaysian Edition* (Butterworths Asia: Singapore 1998) at Ch 1.

¹⁵ An ‘electronic record’ is defined in s 2 of the ETA.

¹⁶ See s 12 of the UNCITRAL Model Law.

The Model Law is intended to provide essential procedures and principles for facilitating the use of modern techniques for recording and communicating information in various types of circumstances. However, it is a ‘framework’ law that does not itself set forth all the rules and regulations that may be necessary to implement those techniques in an enacting State. Moreover, the Model Law is not intended to cover every aspect of the use of electronic commerce. Accordingly, an enacting State may wish to issue regulations to fill in the procedural details for procedures authorized by the Model Law and to take account of the specific, possibly changing, circumstances at play in the enacting State, without compromising the objectives of the Model Law. It is recommended that, should it decide to issue such regulation, an enacting State should give particular attention to the need to maintain the beneficial flexibility of the provisions in the Model Law.¹⁷

While laudable, this attempted compromise is, with respect, more apt to confuse rather than enlighten. The very concept of a ‘framework’ must necessarily entail some *substantive* effects, albeit on a rather broad level. As already alluded to above, however, the content of the relevant provisions of the ETA is, on this ‘framework’ approach, rather vague and general and hence engenders, in our view, no detrimental effects as such.

In terms of the scope of application of the ETA, however, section 4(1) should be noted, which reads as follows:

- (1) Parts II¹⁸ and IV¹⁹ shall not apply to any rule of law requiring writing or signatures in any of the following matters:
 - (a) the creation or execution of a will;
 - (b) negotiable instruments;
 - (c) the creation, performance or enforcement of an indenture, declaration of trust or power of attorney with the exception of constructive and resulting trusts;
 - (d) any contract for the sale or other disposition of immovable property, or any interest in such property;
 - (e) the conveyance of immovable property or the transfer of any interest in immovable property;
 - (f) documents of title.²⁰

In contrast to the Singapore ETA, however, the provisions of the pro-

¹⁷ Guide to Enactment of the UNCITRAL Model Law on Electronic Commerce, para 13.

¹⁸ Comprising ss 6–9 (entitled ‘Electronic Records and Signatures Generally’).

¹⁹ Comprising ss 11–15 (entitled ‘Electronic Contracts’).

²⁰ Under s 4(2), ‘[t]he Minister may by order modify the provisions of subsection (1) by adding, deleting or amending any class of transactions or matters’.

posed Article 2B are, as already mentioned, extremely comprehensive and regulate most aspects traditionally dealt with (in the Commonwealth in general²¹ and Singapore in particular) by the common law of contract.²² Indeed, the 'Preface' to the Article itself states that it 'is in effect a cyberspace contract statute'. This is not, perhaps, surprising in view of the fact that the Uniform Commercial Code, in Article 2 itself, deals comprehensively with these various aspects in the context of the law relating to sales. Looked at in this light, the proposed Article 2B may be viewed as attempting to codify (in the context of software contracts and licences of information) what is already to be found in Article 2 (in the context of sales). Further, as Professor Nimmer points out, 'Article 2B supports the idea of *contract freedom*'.²³ However, it should be noted that certain licensing activities in not a few traditional fields (in, for instance, wholesale or retail transfer of funds (including, for example, credit card transactions); letters of credit (as well as documents of title, financial assets, investment property and other similar assets) that are held in a fiduciary or agency capacity;²⁴ contracts for personal or entertainment services by an individual or group of individuals;²⁵ licences for regularly scheduled audio or video programming by broadcast or cable; as well as licences of patents and trademarks) are nevertheless excluded from the ambit of Article 2B.²⁶

Amongst the many traditional contractual issues dealt with by Article 2B are the following: the formation of online contracts;²⁷ parol evidence rule;²⁸

²¹ Although New Zealand does have many specific and significant contract statutes: see generally J.F. Burrows, J. Finn and S.M.D. Todd, *Law of Contract in New Zealand (a successor to Cheshire & Fifoot's Law of Contract, 8th New Zealand edition)* (Butterworths: Wellington 1997). For the Australian position, see generally J.W. Carter and D.J. Harland, *Contract Law in Australia* (3rd ed, Butterworths: Sydney 1996).

²² For an excellent overview, see M.L. Rustad, 'Commercial Law Infrastructure for the Age of Information' (1997) 15 *John Marshall Journal of Computer & Information Law* 255. Reference may also be made to Nimmer, 'Article 2B: An Introduction', above, note 3.

²³ See Nimmer, 'Article 2B: An Introduction', above, note 3 at 220 (emphasis added); see also at 234 and 253.

²⁴ Cf. s 4(1) of the Singapore ETA, reproduced in the main text, above.

²⁵ Other than a contract with an independent contractor to develop, support, modify or maintain software.

²⁶ See § 2B-104.

²⁷ See, in particular, §§ 2B-202 to 2B-205. Cf. also the more specific situations and propositions discussed in the next paragraph.

²⁸ See § 2B-301.

warranties;²⁹ assignments;³⁰ breach³¹ (including anticipatory breach³²); and remedies.³³ There is also a proposed provision rendering unenforceable '[a] contract term that violates a fundamental public policy . . . to the extent that the term is invalid under that policy'.³⁴ It should also be noted that the *general strategy* is the utilization of certain stipulated *defaults*.³⁵

On a more specific level, some of the rules promulgated in the proposed Article 2B make eminently good sense in the context of cyberspace. For instance, Article 2B has (subject to certain exceptions) rejected the traditional 'last shot' approach³⁶ in the context of the 'battle of the forms', and this, again, may find some support in principle in the quite different atmosphere of cyberspace.³⁷

2.1.2 Attribution of Electronic Messages

In the faceless and quite different atmosphere of cyberspace, one of the most significant issues which has to be resolved is the issue of attribution. How can the addressee be sure that the message purported to be sent by the originator is indeed sent by the originator? Both the Singapore ETA and

²⁹ See generally §§ 2B-401 to 2B-406. § 2B-406 is significant insofar as it permits, under certain stipulated conditions, for the modification, limitation or disclaiming of warranties. See also generally Rustad, above, note 22, at 289-296. Reference may also be made to J.R. Wolfson, 'Express Warranties and Published Information Content under Article 2B: Does the Shoe Fit?' (1997) 15 *John Marshall Journal of Computer & Information Law* 337 and R.W. Gomulkiewicz, 'The Implied Warranty of Merchantability in Software Contracts: A Warranty No One Dares to Give and How to Change That' (1997) 15 *John Marshall Journal of Computer & Information Law* 393, both of which tackle more specific issues with respect to express and implied warranties, respectively.

³⁰ See, in particular, § 2B-502. See also generally Rustad, above, note 22 at 297-298; Nimmer, 'Article 2B: An Introduction', above, note 3 at 244-245; and B.G. Handlos, 'Drafting and Negotiating Commercial Software Licenses: A Review of Selected Issues Raised by Proposed Uniform Commercial Code Article 2B' (1997) 30 *Creighton L Rev* 1189 at 1200 *et seq.*

³¹ See §§ 2B-601 and 2B-109. See also generally Rustad, above, note 22 at 299-305; Nimmer, 'Article 2B: An Introduction', above, note 3 at 241-244; and Handlos, above, note 30 at 1215-1219.

³² See §§ 2B-621 and 2B-622.

³³ See generally §§ 2B-701 to 2B-717 (in particular, § 2B-707 with respect to the general provision for damages (including the important principle of mitigation, as to which see § 2B-707(a)); and see § 2B-704 with respect to *liquidated* damages and § 2B-715 with respect to *consequential and incidental* damages, as well as § 2B-711 with respect to *specific performance*). Reference should also be made to § 2B-102(8) (definition of 'consequential damages'); § 2B-102(17) (definition of 'direct damages'); § 2B-102(23) (definition of 'incidental damages'); § 2B-710 (entitled 'Recoupment'); as well as § 2B-706 (entitled 'Remedies for Fraud'). See also generally Rustad, above, note 22 at 305-312 and Handlos, above, note 30 at 1220 *et seq.*

³⁴ See § 2B-105(b).

³⁵ See generally Rustad, above, note 22 at 286-288 and Nimmer, 'Article 2B: An Introduction', above, note 3 at 226-227 and 231 *et seq.* for a succinct account.

³⁶ An oft-cited (but problematic) decision in the English context is *Butler Machine Tool Co Ltd v Ex-Cell-O Corp* [1979] 1 WLR 401; noted Rawlings, (1979) 42 *MLR* 715. But cf. per Lord Denning MR in the selfsame case – an approach that was implicitly rejected in the subsequent House of Lords decision of *Gibson v Manchester City Council* [1979] 1 WLR 294. For a general account under English as well as Singapore and Malaysian law, see Phang, above, note 14 at 298-299.

³⁷ See § 2B-209, as well as § 2B-203; see also esp. § 1 of the Reporter's Notes to § 2B-209. And see generally Rustad, above, note 22 at 288-289. Though cf. certain particular contexts, such as electronic auctions, where the 'last shot' approach may in fact be preferable.

Article 2B have to come to terms with this problem. Section 13 of the ETA³⁸ deals with the issue of attribution with the following series of escalating³⁹ rules:

Rule 1: If A (the party who allegedly sent the electronic message – referred to in the ETA as the ‘originator’) *did in fact send* the message to B (the party who allegedly received the electronic message – referred to in the ETA as the ‘addressee’), the message is A’s.⁴⁰

Rule 2: If not, and B receives a message allegedly sent by A, it will be deemed to be A’s message if it was *sent by A’s agent*.⁴¹

Rule 3: Alternatively, if B receives a message allegedly sent by A, it will be deemed to be A’s message if it was *sent by a computer system programmed by A, or programmed by A’s agent*.⁴²

Rule 4: Otherwise, if B receives a message allegedly sent by A, B is entitled to regard it as A’s *if B applied a procedure*, either previously agreed to by A⁴³ or implemented by someone related to A,⁴⁴ for verifying that the message is A’s.⁴⁵

Section 13 contains some necessary reference to agency law in general and the issue of authorization in particular;⁴⁶ all this is consistent with the general law of agency, although s 13(8) expressly states, *ex abundante cautela*, that ‘[n]othing in this section shall affect the law of agency or the law on formation of contracts’; this lastmentioned provision suggests that the entire section itself is not substantive but, rather, procedural. However, the line between procedure on the one hand and substance on the other is not always clear and there can be (and often is) a blurring of the lines; indeed, s 13(8) itself does not, on a literal reading at least, clearly suggest that the provision as a whole is only procedural and not substantive in its effect, although that is of course clearly one possible construction.

Interestingly, Article 2B observes similar rules. The effect of Section

³⁸ See s 13 of the UNCITRAL Model Law. Cf. R.T. Nimmer, ‘Electronic Contracting: Legal Issues’ (1996) 14 *John Marshall Journal of Computer & Information Law* 211 at 219-220; though cf., in turn, the discussion in the next Section.

³⁹ The rules must be presumed to be escalating because they are obviously mutually exclusive, and they use slightly different language – e.g. s 13(1) states that the message ‘is’ A’s; s 13(2) states that the message ‘is deemed’ to be A’s whereas s 13(3) states that B is ‘entitled to regard’ the message as A’s.

⁴⁰ S 13(1).

⁴¹ S 13(2)(a).

⁴² S 13(2)(b).

⁴³ S 13(3)(a).

⁴⁴ S 13(3)(b).

⁴⁵ But not from the point in time when A informed B that the message is not his, and gives B reasonable time to act (s 13(4)(a)), or when B knows or ought to know that the message was not A’s (s 13(4)(b)), or (and this is rather broad and somewhat cryptic) ‘if, in all the circumstances of the case, it is unconscionable for [B] to regard the electronic record as that of [A] or to act on that assumption’ (s 13(4)(c)); and see below, note 99).

⁴⁶ See s 13(2)(a) of the ETA.

2B-116 is to affirm substantially the application of all four of the rules embodied in s 13 of the ETA as set out above. Section 2B-116(a)(1) confirms that an electronic message is attributed to the originator if it was in fact sent by the originator (Rule 1, above), which will include the originator's agent (Rule 2, above).⁴⁷ In addition, Section 2B-116(a)(1) allows electronic agents to take the place of human agents (Rule 3, above). Since these electronic agents are computer systems that the originator programmes to send messages, the originator must be held responsible for its operations.⁴⁸ Finally, Section 2B-116(a)(2) permits the recipient of the electronic message to attribute it to the originator if he applies a commercially reasonable attribution procedure for verifying the identity of the originator, and reasonably so concludes (Rule 4, above).

And again, like s 13 of the ETA, where the rules are triggered, there is an operative assumption (s 13(5) of the ETA) or presumption (Section 2B-116(b)) that the recipient is entitled to regard the electronic message as that of the putative originator's. However, the assumption or presumption is intended to apply only to the extent that the recipient exercised reasonable care (s 13(6) of the ETA) or the originator failed to exercise reasonable care (Section 2B-116(c)(2)) in the receipt or transmission of the message.

2.1.3 *Receipt of Electronic Messages*

Section 14 of the Singapore ETA⁴⁹ deals with the acknowledgment of receipt by the addressee of the electronic record, whilst s 15⁵⁰ is concerned with the time and place of despatch and receipt of an electronic record. One issue that arises with respect to this latter provision (viz s 15) is whether or not it impacts on the substantive law relating to offer and acceptance. As regards the application of the common law rules on offer and acceptance to electronic transactions, the position is certainly unclear. If electronic communications are equated with instantaneous modes of communication, the contract will only be complete when the offeror receives the acceptance of the offeree (the 'actual receipt' rule).⁵¹ But not all forms of electronic communications are instantaneous: electronic records may be collated and transmitted in batches, they may be saved in computer systems for re-transmission, or they may even be forwarded from computer system to computer system only when the recipient requests for his electronic messages. For this

⁴⁷ See § 2 of the Reporter's Notes to § 2B-116. This is because under UCC §1-201, the definition of 'person' and 'organisation' includes agents of that person and organization.

⁴⁸ *Ibid.*

⁴⁹ See s 14 of the UNCITRAL Model Law.

⁵⁰ See s 15 of the UNCITRAL Model Law.

⁵¹ *Entores Ltd v Miles Far East Corporation* [1955] 2 QB 327; *Brinkibon Ltd v Staghag Stahl und Stahlarenhandels-gesellschaft mbH* [1983] 2 AC 34.

reason, it has been suggested that perhaps the postal acceptance rule should apply to such circumstances.⁵²

To address this uncertainty, it is suggested that a literal construction of s 15 does not indicate why the provision should not impact on the substantive law in the context of the law relating to offer and acceptance in the context of electronic transactions. Indeed, it is further suggested that what s 15 does is to *supplement* the existing rules as to offer and acceptance, having special regard to electronic transactions, as does s 14, albeit in a more specific context. As is explained by the UNCITRAL Guide to Enactment, s 15 is intended to prescribe legal rules to allow parties to ascertain 'the time and place of receipt of information', which would otherwise be difficult to ascertain if rules that were designed for non-electronic communications were applied to electronic communication techniques. Similarly, in the Report of the Australian Electronic Commerce Expert Group to the Attorney General, entitled *Electronic Commerce: Building the Legal Framework*, the authors also noted that there is a need to address the issue of whether an electronic record is communicated only if it is actually read by the recipient.⁵³

Article 2B broadly favours the same solution as that expressed in s 15, namely, to affirm that an electronic record can be received even though it is not actually read by the recipient. In this regard, both pieces of legislation have adopted a half-way house position between the 'actual receipt' rule and the postal acceptance rule.⁵⁴ Section 2B-102(38)(B)(ii)(II) states that an electronic notification is received if it 'come[s] into existence in an information processing system in a form capable of being processed by or perceived from a system of that type, if the recipient uses, or otherwise has designated or holds out, that system as a place for receipt of such notices.' Likewise, s 15(2)(a)(i) states that receipt of an electronic record takes place 'at the time when the electronic record enters the designated information system'. Although there are differences in the circumstances under which this rule is triggered, and s 15(2) leaves unexplicated the vital concept of an electronic record 'entering an information system', both provisions in effect recognize that when a transmitted electronic message is accessible in the addressee's designated computer system, the message is deemed to have been 'received'.

2.1.4 *Shrink-wrap Licence Agreements*

In the even more specialized context of shrink-wrap and allied licence agreements,⁵⁵ Article 2B seeks to break new ground by attempting to balance the interests of the software developer on the one hand and the con-

⁵² Reed, *Computer Law* (3rd ed, 1996), at 304-305.

⁵³ Paras 2.15.15 and 2.15.17.

⁵⁴ See § 2B-120(a).

⁵⁵ And see J.C. Wang, 'ProCD, Inc v Zeidenberg and Article 2B: Finally, the Validation of Shrink-Wrap Licenses' (1997) 15 *John Marshall Journal of Computer & Information Law* 439. But cf. the main text at note 69.

sumer on the other, since any ruling wholly favouring one at the expense of the other would be a classic instance of cutting off one's nose to spite one's face: a ruling in favour of the software developer would unduly prejudice consumers,⁵⁶ whilst a ruling in favour of consumers would place an intolerable burden on software developers who cannot afford to individually negotiate terms with consumers in what is basically a mass-market context⁵⁷ or who would so negotiate with a resultant increase in prices that would put software beyond the realistic reach of consumers – thus totally undermining the *raison d'être* of the industry as a whole. Article 2B attempts to steer a middle-course by stipulating notice requirements (in the context of a *mass-market*)⁵⁸ that are intended to afford the consumer some minimum level of protection.⁵⁹ Indeed, the court itself can invalidate unfair terms in circumstances where the party proposing the term knew or had reason to know that an ordinary reasonable buyer would have objected to the entire transaction that included the term in question.⁶⁰ It bears repeating, however, that this balance is achieved in the context of the new concept of a 'mass-market', which the Reporter for the proposed Article 2B, Professor Nimmer, succinctly describes as follows:

'Mass-market' *expands* consumer protections into a marketplace of transactions *even if a particular transaction does not involve a consumer*. . . . A mass market is a retail market where information is made available in pre-packaged form under generally similar terms to the general public and in which the general public is a frequent participant. The concept applies *only* to information *aimed at the general public as a whole, including consumers*.⁶¹

The 'mass-market' transaction is additionally recognized in Article 2B as a specialized type of contractual agreement by definitively resolving the vexing problem as to the bifurcation of property rights as manifested in the medium on which the software is sold on the one hand, and the intellectual property rights in the software itself on the other. Thus the sale of mass-market computer software entails the purchaser acquiring rights to both

⁵⁶ See § 2B-102(10) (definition of 'consumer'). And see generally M.J. Howard Dively and D.A. Cohen, 'Treatment of Consumers Under Proposed UCC Article 2B Licenses' (1997) 15 *John Marshall Journal of Computer & Information Law* 355. And see, in particular, at 322, where the learned authors observe thus:

The provisions of Article 2B that provide special treatment exclusively for consumers are those affecting choice of law, choice of forum, electronic error, the effect of a no-oral modification of clause, and a limitation on what are commonly called 'hell and highwater clauses'.

The provisions concerned are §§ 2B-108; 2B-109; 2B-117; 2B-303; and 2B-618, respectively.

⁵⁷ See § 2B-102(31) (definition of 'mass-market license') and § 2B-102(32) (definition of 'mass-market transaction').

⁵⁸ And see above, note 57.

⁵⁹ See § 2B-208 (entitled 'Mass-Market Licenses').

⁶⁰ And see generally Rustad, above, note 22 at 280-286.

⁶¹ See § 28 of the Reporter's Notes to § 2B-102 (emphasis added).

the medium as well as the software. But such a transaction is complicated by the fact that the rights are acquired as against *different* parties – the immediate seller supplies the medium, but the developer of the software supplies the licence to use the software. In addition, it is inappropriate to analyse this as two contracts in tandem, because in reality, the software purchaser's interest in the software medium is irrelevant if he does not also acquire a right to use the intellectual property in the software itself.⁶² The more important right must surely be the licence to use functional and operative software, and not the right to the medium as such.⁶³

There are also attendant difficulties such as privity of contract and absence of consideration in allowing the purchaser to seek remedies such as asking for a refund against the immediate seller for breaches of the software licence.⁶⁴ In addition, most of these mass-market softwares are sold with software licences that are either prominently displayed on the software packaging, with a term that specifies that they become effective when the transparent plastic or cellophane 'shrinkwrap' is torn by the customer,⁶⁵ or may not even be accessible at all before the software packages are sold. Various legal analyses have been sought to legitimize this commercial practice of selling software,⁶⁶ but there has yet to be an authoritative judicial pronouncement on the validity of this practice. The approach which has found greatest favour, and appears most supportable, is the approach that treats the software licence as the software producer's offer to the software user, which the user accepts by conduct by breaking the shrinkwrap or using the software.⁶⁷ This approach was sketched out by the US 7th Circuit in *ProCD v Zeidenberg*,⁶⁸ although that was not strictly speaking a shrinkwrap case but a case which required the software user to accept the terms of the software laid down by the software producer, before allowing the user to proceed to use the software.⁶⁹

This is also the approach which has now received sanction in Article 2B. The effect of Section 2B-207(a) (2) is that if the software is not sold pursuant

⁶² *Beta Computers (Europe) Ltd v Adobe Systems (Europe) Ltd* [1996] FSR 367 per Lord Penrose at 371.

⁶³ See above, note 62.

⁶⁴ Although a novel solution was found for this problem in *Beta Computers (Europe) Ltd v Adobe Systems (Europe) Ltd* [1996] FSR 367 by using the Scottish doctrine of *ius quaesitum tertio*, which has no common law counterpart.

⁶⁵ *ProCD v Zeidenberg* 86 F3d 1447 (7th Cir, 1996) at 1449 per Circuit Judge Easterbrook.

⁶⁶ As a contract of sale subject to a condition subsequent (the software licence), this analysis was looked into in *Beta Computers v Adobe Systems* [1996] FSR 367 at 381, but found to require a suspensive condition that is unsupported by trade practices. As a conditional contract of sale subject to the purchaser accepting the software licence terms, this analysis finds slim support in *Step-Saver Data Sys Inc v Wyse Tech* 939 F2d 91 at 105-6 (3rd Cir, 1991) and *Arizona Retail Sys Inc v The Software Link, Inc* 831 F Supp 759 at 766 (D Ariz, 1993).

⁶⁷ In acceptance by conduct, the requirement of communication of the acceptance by the user to the software producer is waived by the producer. See *Re Charge Card Services* [1987] 1 Ch 150 at 161; [1989] Ch 417 at 512, *The 'Santa Clara'* [1993] 2 Lloyd's Rep 301 at 304 col 2 and *Minorities v Afribank* [1995] 1 Lloyd's Rep 134.

⁶⁸ 86 F 3d 1447 (7th Cir, 1996).

⁶⁹ 86 F 3d 1447 (7th Cir, 1996) at 1452.

to a mass-market transaction, where at the point of sale, the purchaser did not have the opportunity to review the contractual terms, the purchaser can manifest his assent to such terms at any time after the party has had a 'reasonable opportunity to review them'.⁷⁰ And such assent can take the form of assent by conduct.⁷¹ Where the software is sold pursuant to a mass-market transaction, Section 2B-208(a) permits the purchaser to be bound by such terms 'only if the party agrees to the mass-market license, by manifesting assent or otherwise, before or during the initial performance or use of, or access to, the information or informational rights'.⁷² Additional protection is also given to the purchaser by granting him a legislative right to a refund of the purchase price of the software.⁷³

One of the two most major pieces of innovation found in Article 2B on shrinkwrap licences is the granting of the purchaser's right of refund against not only the software producer, but also the retailer or distributor of the software.⁷⁴ This is also achieved by way of the other major piece of innovation in Article 2B in Section 2B-617, by subjecting the contract between the software purchaser and the software retailer/distributor to the purchaser's agreement to the software producer's licence. If the software purchaser does not agree with the terms of the licence, he has a right of refund on return of the software.⁷⁵ So Section 2B-617 in effect legislatively achieves what Lord Penrose sought to achieve judicially in *Beta Computers (Europe) Ltd v Adobe Systems (Europe) Ltd*.⁷⁶ As is previously explained, the net result is to enable all parties to benefit from this legal arrangement: the purchaser as the end user is now granted rights against both the software retailer/distributor as well as the software producer, and the software producer is legally assured of the enforceability of the software licence agreement with the purchaser. This bold piece of innovation has, however, yet to find a place in the Singapore ETA.

2.1.5 *Concept of Breach*

We have noted some differences between the Singapore common law⁷⁷ and Article 2B in the preceding paragraph. However, there are, it should be noted, points of commonality between some parts of the Singapore com-

⁷⁰ § 2B-112(a).

⁷¹ § 2B-111(a)(2).

⁷² So in contrast to non mass-market transactions, the assent to the terms of the licence in a mass-market transaction must be manifested at an earlier stage of the use of, or access to, the software and its information.

⁷³ § 2B-208(b). Other rights which he acquires are a right to be compensated for the reasonable expenses incurred in returning the software, and the loss caused by the installation of the software in order to view the software or its information.

⁷⁴ § 2B-102(40) (definition of 'refund').

⁷⁵ § 2B-617, Reporter's Notes (Proposed Draft, 1 Aug 1998), para 2c.

⁷⁶ [1996] FSR 367.

⁷⁷ Which would include, in the main (albeit not always), the English law as well; see s 3 of the Singapore Application of English Law Act (Cap 7A, 1994 Rev Ed, Statutes of the Republic of Singapore) and generally Phang, above, note 14 at 19-22.

mon law and the (corresponding) provisions in Article 2B – which are of significance insofar as potential reform in the Singapore context in the foreseeable future is concerned. One instance pertains to the concept of a ‘fundamental breach’ which, in the context of Article 2B is termed a ‘material breach’. In particular, Section 2B-109(b) provides as follows:

- (b) A breach of contract⁷⁸ is a material breach if:
 - (1) the contract so provides;
 - (2) the breach is a failure to perform an agreed term that is an *essential element* of the agreement; or
 - (3) the circumstances, including the language of the agreement, the reasonable expectations of the parties, the standards and practices of the trade or industry, or the character of the breach, indicate that:
 - (A) the breach caused *or is likely to cause substantial harm* to the aggrieved party, such as costs or losses that significantly exceed the contract value; or
 - (B) the breach *substantially deprived or is likely substantially to deprive* the aggrieved party of *a substantial benefit it reasonably expected under the contract*.⁷⁹

And Section 2B-601(d) provides:

A party may refuse a performance that is a material breach as to that performance or if refusal is permitted under Section 2B-609(b).⁸⁰ The aggrieved party may *cancel* the contract *only if* the breach is a *material breach* of the entire contract *or* the agreement so provides.⁸¹

Finally, and in a related vein, Section 2B-702(a) provides:

- (a) Except as provided in Section 2B-609(b),⁸² a party may cancel the contract if:
 - (1) there is a *material breach*⁸³ of the entire agreement which has not been cured⁸⁴ or waived.⁸⁵

⁷⁸ See § 2B-109(a). Contrast this with the concept of ‘termination’: see § 2B-102(47). See also § 2B-606 (entitled ‘Cure of Breach of Contract’).

⁷⁹ Emphasis added.

⁸⁰ § 2B-609(b) reads as follows:

In a mass-market license, a licensee may refuse a tender of delivery of a copy if the contract calls only for a single tender and the copy or tender fail in any respect to conform to the contract. The refusal cancels the contract.

⁸¹ Emphasis added.

⁸² See above, note 80.

⁸³ Emphasis added.

⁸⁴ See § 2B-606; see also above, note 78.

⁸⁵ See § 2B-605.

The position under Singapore law is, in substance, very similar: although there are, admittedly, differences in terminology. Only a brief summary can be attempted here. Insofar as fundamental breach is concerned, one issue is a terminological one, i.e. whether there is a distinction between ‘fundamental breach’ and ‘breach of a fundamental term’. A quick perusal of various judgments as well as relevant literature gives the impression that both phrases are used interchangeably.⁸⁶ It is suggested, however, that this is not (or at least ought not to be) the case. It is submitted that a ‘fundamental term’ focuses, as the very phrase itself suggests, on the *term* itself; or, to translate it into a more practical context, the *intentions of the parties as embodied within the language of the contract as well as the surrounding circumstances under which it was entered into*.⁸⁷ A ‘fundamental breach’, on the other hand, focuses on the *consequences* of a breach, which consequences are, in fact, so *fundamental or serious* that they would ‘deprive the party not in default of substantially the whole benefit which it was intended that he should obtain from the contract’,⁸⁸ subject to express agreement to the contrary by the parties to the contract themselves.⁸⁹ Insofar as discharge by breach is concerned, the first focus is embodied within the ‘condition-warranty approach’,⁹⁰ whilst the second is embodied within the ‘*Hong Kong Fir* approach’.⁹¹ A moment’s reflection would, it is hoped, reveal the possibilities for contrasting results in certain fact situations, where the application of both approaches would give rise to diametrically opposed results in the event of a breach of contract. Overlaps are, of course, possible and in such instances, the application of either approach would give the same result – for example, where the term concerned would be classified as a ‘condition’ under the ‘condition-warranty approach’ and whose breach *also* results in the innocent party being deprived substantially of the whole benefit of the contract (applying the ‘*Hong Kong Fir* approach’); conversely, there would also be an overlap where the term in question would be classified as a ‘warranty’ under the ‘condition-warranty approach’ and whose breach does *not* result in the innocent party being deprived substantially of the whole benefit of the contract (applying the ‘*Hong Kong Fir* approach’). Where, how-

⁸⁶ But cf. B. Coote, *Exception Clauses* (Sweet & Maxwell: London 1964) at 111; but cf., in turn, at 113.

⁸⁷ This is, in the context of ascertaining the relative importance of the terms of a contract, the ‘traditional’ ‘condition-warranty approach’ encapsulated within the oft-cited statement of principle by Bowen LJ in the English Court of Appeal decision of *Bentsen v Taylor, Sons & Co* [1893] 2 QB 274 at 281.

⁸⁸ This is, in the context of ascertaining the relative importance of terms of a contract, the *contrasting* approach to the ‘condition-warranty approach’ (as to which, see *supra*, note 87) and which is embodied in the English Court of Appeal decision of *Hong Kong Fir Shipping Co Ltd v Kawasaki Kishen Kaisha Ltd* [1962] 2 QB 26; and hence popularly referred to as the ‘*Hong Kong Fir* approach’. See generally at 69-70, per Diplock LJ (as he then was), and, with respect to the quotation in the main text, at 69.

⁸⁹ [1962] 2 QB 26 at 69.

⁹⁰ See above, note 87.

⁹¹ See above, note 88.

ever, no overlap results, the conceptual contrast is brought to the fore. And it is this contrast that has been little discussed in the relevant literature.⁹²

An even cursory perusal of Sections 2B-109(b) and 2B-601(d) (as set out above⁹³) will demonstrate that the ambiguity present in the Singapore context is replicated in the context of Article 2B as well. Section 2B-109(b), whilst setting out, in substance at least, what are the ‘condition-warranty approach’⁹⁴ and the ‘*Hong Kong Fir* approach’⁹⁵ in the Singapore context, does not (as is the case locally) prioritize between the two⁹⁶ and, by virtue of Section 2B-601(d), simply states that the innocent party may elect to treat the contract as discharged should either situation arise.

2.1.6 *Unconscionable Terms in the Contract*

One interesting instance where there is present divergence but scope for possible convergence in the future lies in the sphere of *unconscionability*. Article 2B adopts the position that is already embodied in Article 2,⁹⁷ endorsing the doctrine in the following language in Section 2B-110(a), as follows:

If a court as a matter of law finds the contract or any term of the contract to have been unconscionable at the time it was made, the court may refuse to enforce the contract, or it may enforce the remainder of the contract without the unconscionable term, or it may so limit the application of any unconscionable term as to avoid any unconscionable result.⁹⁸

The position in Singapore endorses, at present at least, the more conservative English approach, which confines the doctrine of unconscionability to the narrowest of situations, viz those involving expectant heirs and

⁹² One of the authors has attempted to elaborate on these ideas: see e.g., Phang, above, note 14 esp. at and, by the same author, ‘Trends in the Core Areas of Singapore Law between 1990 and 1995 – Contract’ in *Review of Judicial and Legal Reforms in Singapore Between 1990 and 1995* (Butterworths Asia: Singapore 1996), pp 250-317 at 299-304. And cf. the present writer’s proposal, utilising a ‘hybrid approach’: see generally the works cited above, note 14. See also the House of Lords decisions of *Bunge Corp, New York v Tradax Export SA, Panama* [1981] 1 WLR 711 and *Torvald Klaveness A/S v Arni Maritime Corp, (The ‘Gregos’)* [1995] 1 Lloyd’s Rep 1 at 9. Cf. the Malaysian Court of Appeal decision of *Ching Yik Development Sdn Bhd v Setapak Heights Development Sdn Bhd* [1996] 3 MLJ 675.

⁹³ See above, notes 87 and 88, respectively.

⁹⁴ See § 2B-109(b)(2).

⁹⁵ See § 2B-109(b)(3).

⁹⁶ This is, in fact, very similar to the approach adopted by Lord Diplock in *Photo Production Ltd v Securicor Transport Ltd* [1980] AC 827, esp. at 849 – a somewhat different approach from that adopted by him in the *Hong Kong Fir* case, above, note 88.

⁹⁷ See § 2-302.

⁹⁸ Not surprisingly, perhaps, this provision (amongst others) *cannot* be varied by the agreement of the parties: see § 2B-106(b)(3). Reference may also be made to the Note to the proposed § 2B-105(b) (as to which, see above, note 34), where amendments were proposed to § 2B-110, so as to include contracts or contract terms that are not only unconscionable but are *also* (alternatively) ‘contrary to public policies relating to innovation, competition, and free expression’.

improvident transactions.⁹⁹ However, there is some evidence of a broader approach under English law,¹⁰⁰ although the present Singapore situation remains somewhat ambiguous tending, on balance however, towards a more conservative position.¹⁰¹ The question remains as to whether or not the Singapore courts will adopt the bolder Australian approach towards unconscionability as embodied in the leading High Court decision in *Commercial Bank of Australia v Amadio*.¹⁰² If it does, as one of the present authors has suggested it should,¹⁰³ this would bring the Singapore position very close to that which exists under American law.

2.1.7 *Other Issues*

One obvious point should, of course, be mentioned: that there are parts of the proposed Article 2B which are clearly inappropriate to the Singapore context, if nothing else, because there already exists adequate legislation under Singapore law. One obvious instance relates to the law of limitation,¹⁰⁴ for which there is already provision in the local context.¹⁰⁵ There is also no substantive doctrine of privity of contract as such, which is in contrast to the position that obtains in Singapore;¹⁰⁶ the relevant provision in Article 2B¹⁰⁷ is therefore inappropriate to the Singapore context until such time that reform in the doctrine of privity is effected, at least insofar as contracts for the benefit of third parties are concerned.¹⁰⁸

2.2 *On the Significance of Authentication and Signatures*

Another major, albeit very much more specific, difference between the proposed Article 2B and the Singapore ETA centres on the significance accorded to the concept of authentication in general and signatures in particular (in this lastmentioned respect especially with respect to digital signatures). Professor Nimmer succinctly summarizes the basic distinction thus:

⁹⁹ For a good general account, see N. Bamforth, 'Unconscionability as a vitiating factor' [1995] *LMCLQ* 538.

Though cf. s 13(4)(c) of the Singapore ETA, where the term 'unconscionable' is utilized in the context of attribution of electronic records.

¹⁰⁰ See *Credit Lyonnais Bank Nederland NV v Burch* [1997] 1 All ER 144; noted H. Tjio, (1997) 113 *LQR* 10; R. Hooley and J. O'Sullivan, [1997] *LMCLQ* 17; and M. Chen-Wishart, [1997] *CLJ* 60.

¹⁰¹ See generally Phang, above, note 14 and, by the same author, 'Vitiating Factors in Contract Law – The Interaction of Theory and Practice' (1998) 10 *SACJ* 1 at 46-60, and the authorities cited and discussed therein.

¹⁰² (1983) 151 CLR 447. See also the (also) Australian High Court decision of *Louth v Diprose* (1992) 175 CLR 621. Though cf. the (yet again) Australian High Court decision of *Garcia v National Australian Bank Ltd* (1998) 155 ALR 614.

¹⁰³ See the works cited at note 101, above.

¹⁰⁴ See § 2B-705.

¹⁰⁵ See esp. s 6 of the Limitation Act (Cap 163, 1985 Rev Ed, Statutes of the Republic of Singapore).

¹⁰⁶ As to which see generally Phang, above, note 14 at Ch 15.

¹⁰⁷ Viz § 2B-409.

¹⁰⁸ And see Phang, above, note 14 at 778-779 for a summary of the recent English Law Commission's proposals for reform in this sphere. See also now the Contracts (Rights of Third Parties) Bill.

Article 2B deals with reliability, but *rejects* the *single technology and regulatory* approach in ... digital signature laws [as is the situation with the Singapore ETA]. It relies instead on agreement¹⁰⁹ and open technology. If the parties *agree to or adopt*¹¹⁰ a *commercially reasonable method* for attributing a record to a party, compliance with that method creates a signature and contributes to making a party attributable with the message. Article 2B refers to this as an ‘attribution procedure’.¹¹¹ Compliance with an attribution procedure constitutes an effective ‘authentication’¹¹² and creates a rebuttable presumption that the authentication was made by the person made attributable by the procedure.¹¹³

In his notes (as Reporter) to Section 28-102, Professor Nimmer observes, in similar vein, thus:

The definition [of ‘authenticate’] is technologically neutral. ‘Digital signatures’, recognized in some states and which rely on a specified encryption technology and a certification system [the position adopted, *inter alia*, under the Singapore ETA, as to which see the discussion below], qualify as authentication for Article 2B. *The Article 2B concept is broader however. It recognizes that technology and commercial practice will evolve. There is no effort to set a minimum standard of sufficiency for an authentication, rather unreliable procedures that purportedly authenticate a record are subject to evidentiary scrutiny as to whether they were used with the requisite intent, whether they were the act of the purported party, and other issues.*¹¹⁴

Indeed, unlike the relevant provisions of the Singapore ETA,¹¹⁵ Article 2B utilizes the rubric of ‘authentication’¹¹⁶ rather than ‘signature’.¹¹⁷ It

¹⁰⁹ And see above, note 23.

¹¹⁰ Emphasis here in the original text.

¹¹¹ Defined in § 2B-102(2). And see generally §§ 2B-114 to 2B-117. To this extent, there is an overlap with the provisions of the Singapore ETA: see below, note 119.

¹¹² And see below, note 114.

¹¹³ See Nimmer, ‘Article 2B: An Introduction’, above, note 3 at 229-230 (emphasis added, except where otherwise indicated).

¹¹⁴ See § 3 of the Reporter’s Notes to § 2B-102 (emphasis added).

¹¹⁵ Though see the discussion below with respect to ss 35 and 36 of the Singapore *Evidence Act* (Cap 97, 1997 Rev Ed, Statutes of the Republic of Singapore).

¹¹⁶ See § 2B-102(3): ‘Authenticate’ means to sign, or otherwise to execute or adopt a symbol or sound, or encrypt or similarly process a record in whole or part, with intent of the authenticating person to:

- (A) identify the person;
- (B) adopt or accept the terms or a particular term of a record that includes or is logically associated or linked with the authentication or to which a record containing the authentication refers; or
- (C) establish the integrity of the information in a record which includes or is logically associated or linked with the authentication or to which a record containing the authentication refers.

See also § 2B-113: ‘A record or authentication may not be denied legal effect solely on the ground that it is in electronic form.’; cf. also, with respect to the Singapore ETA, above, note 15. And on the question of proof of authentication, see § 2B-119.

Reference, however, may also be made to Rule 901 of the US Federal Rules of Evidence which pertains to the requirement of authentication or identification as a condition precedent to admissibility and which is arguably broad enough to cover signatures as well.

¹¹⁷ And see Nimmer, ‘Article 2B: An Introduction’, above, note 3 at 229.

should, however, also be mentioned at this juncture that the concept of ‘authenticity’ does in fact find expression in the Singapore context in sections 35 and 36 of the Singapore Evidence Act,¹¹⁸ (not the Singapore ETA) and may apply to situations that fall outside the ETA itself.

The Singapore ETA, however, focuses (as already mentioned) on the concept of a ‘signature’. Parts II and V of the Act¹¹⁹ deal, respectively, with *electronic* records and signatures generally as well as in secure form,¹²⁰ whilst Parts VI and VII¹²¹ deal with the effect as well as general duties relating to *digital* signatures, respectively. Various definitions, such as ‘electronic record’, ‘electronic signature’ and ‘digital signature’, as well as allied definitions, occur in section 2 of the ETA, but nothing short of a more than rudimentary knowledge of the relevant technology will enable the reader to negotiate his or her way around both these definitions as well as the sections to which they relate.¹²² The general approach, however, is clear: to construct a regime of reliability through the concept of the ‘signature’. The focus in this regard appears to be on *digital* signatures which, through a process of encryption, ensures the necessary security for both the originator of the signature as well as the addressee. An algorithm utilizing two different but mathematically created keys (viz a ‘key pair’¹²³) is employed in an ‘asymmetric cryptosystem’.¹²⁴ The resultant keys thus related are the ‘private’ and ‘public’ keys, respectively. The former *can be used to create* a digital signature, which whilst *technically verifiable* by the latter, cannot be accessed as such because it is currently technically unfeasible to do so. The addressee thus has at his or her disposal the necessary tool (viz the ‘public’ key) to conduct such verification for the purposes of commerce, but faces the potential problem that the person claiming that the signatures verifiable by the relevant ‘public’ key are his or hers may not, in fact, be the true originator of the said signatures. Hence, the need for a third party who, in the

¹¹⁸ Cap 97, 1997 Rev Ed, Statutes of the Republic of Singapore. And see D.K.B Seng, ‘Computer Output as Evidence’ [1997] *Singapore Journal of Legal Studies* 130 at 159-166.

¹¹⁹ Comprising ss 6-9 and 16-18, respectively. And see ss 5, 6, 7 and 10 of the UNCITRAL Model Law and §§ 10-105, 10-110 and 10-120 of the Illinois Electronic Commerce Security Act, respectively.

¹²⁰ On the *Government* use of electronic records and signatures, see Pt XI, comprising s 47. And see § 25-101 of the Illinois Electronic Commerce Security Act.

¹²¹ Comprising ss 19-22 and 23-26, respectively. And see §§ 15-101, 15-105 (of the Illinois Electronic Commerce Security Act), 406(2) and 402 (of the Utah Digital Signature Act) and §§ 15-201, 15-205, 15-210 and 15-215, respectively.

¹²² For an excellent and succinct account, see the American Bar Association, Section of Science and Technology, Information Security Committee’s ‘Digital Signature Guidelines Tutorial’ (at the time of writing to be found at <http://www.abanet.org/scitech/ec/isc/dsg-tutorial.html>). We are indebted to our colleague, Mr Aedit Abdullah, for the reference to this website.

¹²³ And see the definition in s 2.

¹²⁴ Also defined in s 2 as meaning ‘a system capable of generating a secure key pair, consisting of a private key for creating a digital signature, and a public key to verify the digital signature’. Both keys are defined in the same manner in the same provision.

ETA, is referred to as a 'certification authority',¹²⁵ who will certify that the originator of the signature is indeed the true originator: in the terminology of the Act, a 'subscriber', which 'means a person who is the subject named or identified in a certificate issued to him and who holds a private key that corresponds to a public key listed in that certificate'.¹²⁶

It may well be the case that given the relatively small size of the Singapore legal system and the fact that this is the first time it is venturing into this very new area of the law, the adoption of the narrower approach in the first instance may be preferable.

Other interesting issues are also raised, but constraints of space preclude further discussion. For example, do the provisions relating to both electronic as well as digital signatures in the Singapore ETA reduce the scope for arguments centring on the doctrine of mistake, particularly that relating to mistaken identity? It is suggested that a close perusal of the salient provisions reveals that while this ought to be the result in practice, there is still scope for application of the doctrine. However, since the doctrine of mistake in its various aspects operates within very narrow limits in any event,¹²⁷ the ETA may not actually make a significant difference to the actual practical *outcomes* that would have obtained prior to its enactment.¹²⁸

3 Conclusion

As clearly seen, even in the context of the brief discussion above, the American approach (as embodied within the proposed Article 2B) is far more detailed and comprehensive than the Singapore approach, which adopts, in the main, the principal provisions of the UNCITRAL Model Law, and supplements them (in the context of digital signatures) with legislation from a couple of American states.¹²⁹ What is of great interest, at least as viewed from the Singapore perspective, is whether or not the local legislature will, in the foreseeable future, expand the scope of the present ETA to cover other areas traditionally regulated (in the main) by the Singapore common law of contract. The general picture will undoubtedly become clearer with the passage of time as the operation as well as impact of the newly enacted ETA is monitored and assessed. However, given the still-fluid state of the proposed Article 2B, any tangible legislative action in the Singapore context is, realistically speaking, still some way off.

¹²⁵ See, in particular, Pt VIII, comprising ss 27–35. And see §§ 301(1), 301(2), 302, 303, 306, 307(1), 307(3) and (4), 306(3) and 307(5) of the Utah Digital Signature Act as well as (as correlatives of ss 32, 33 and 35) §§ 15-320(a) and 15-320(b) of the Illinois Electronic Commerce Security Act (this lastmentioned provision corresponding to the last two sections of the ETA mentioned, viz ss 33 and 35).

¹²⁶ See s 2 of the ETA. Other relevant definitions are also located in this section.

¹²⁷ See generally Phang, above, note 14 at Ch 9.

¹²⁸ Cf. also Nimmer, 'Article 2B: An Introduction', above, note 3 at 238-240. And see § 4 of the Reporter's Notes to § 2B-115 (which deals with the 'effect of requiring commercially unreasonable attribution procedure').

¹²⁹ And see above, note 9.