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Main Component Extraction Method

Discovering Thoughts, Inventing Future

VOLUME 21

ISSUE 3

VERSION 1.0



GLOBAL JOURNAL OF MANAGEMENT AND BUSINESS RESEARCH: G  
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VOLUME 21 ISSUE 3 (VER. 1.0)

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## Miscarriages of Justice in Australia: Unfinished Business

By Michael Kirby, AC CMG

*Human Imperfection and Criminal Trials-* No system of criminal justice is perfect. Some are more imperfect than others. The imperfections may arise from the wrongs of tyrannical rulers. During such regimes, the judges may become brutal in the extreme. The chances of securing justice from such judges will be remote. Yet even in jurisdictions which pride themselves on the independence and incorruptibility of their judges may sometimes adopt crimes, or follow practices, that seriously impede the conduct of a trial and lead to unjust and wrongful outcomes.

Australia's procedures of criminal justice were mostly inherited from England. This was the case in most of the other colonies of the British Crown. In fact, it is unlikely that the British settlements in Australia, would have been chosen as penal colonies, but for a crisis at the time in the English criminal justice system. Following the American Revolution of 1776-83, it became necessity for Britain to find an alternative place to which convicted prisoners could be sent, after the American settlements secured their independence. Once that happened, the Americans refused to accept more English convicts, preferring the free labour of unpaid slaves to boatloads of low class English prisoners. Even the humblest of these carried with them the residual entitlements of the common law of England, a fact that sometimes made them troublesome.

*GJMBR-G Classification: JEL Code: H10*



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# Miscarriages of Justice in Australia: Unfinished Business

Michael Kirby, AC CMG\*

## I. HUMAN IMPERFECTION AND CRIMINAL TRIALS

No system of criminal justice is perfect. Some are more imperfect than others. The imperfections may arise from the wrongs of tyrannical rulers. During such regimes, the judges may become brutal in the extreme.<sup>1</sup> The chances of securing justice from such judges will be remote. Yet even in jurisdictions which pride themselves on the independence and incorruptibility of their judges may sometimes adopt crimes,<sup>2</sup> or follow practices,<sup>3</sup> that seriously impede the conduct of a trial and lead to unjust and wrongful outcomes.

Australia's procedures of criminal justice were mostly inherited from England. This was the case in most of the other colonies of the British Crown. In fact, it is unlikely that the British settlements in Australia, would have been chosen as penal colonies, but for a crisis at the time in the English criminal justice system.<sup>4</sup> Following the American Revolution of 1776-83, it became necessary for Britain to find an alternative place to which convicted prisoners could be sent, after the American settlements secured their independence. Once that happened, the Americans refused to accept more English convicts, preferring the free labour of unpaid slaves to boatloads of low class English prisoners. Even the humblest of these carried with them the residual entitlements of the common law of England, a fact that sometimes made them troublesome.

The English law had its protective features; but also a harsh and punitive trial system. There were many capital crimes. There were, at first, no procedures for appeal, least of all appeal on the factual merits. Even for conviction of seemingly trivial offences, the sentences imposed were heavy in order to deter crime.

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<sup>1</sup> Helmut Ortner, *Hitler's Executioner: Roland Freisler President of the Nazi People's Court*, Frontline Books, London, 2018.

<sup>2</sup> See e.g. the "unnatural offences" then appearing in *Crimes Act 1901* (NSW), ss79, 80, 81, 81A. Consent was no defence: *The Queen v McDonald* (1878) 1 SCR (N.S.) 173.

<sup>3</sup> Such as the prohibition on the accused's entitlement to give oral testimony on oath in support of the defence.

<sup>4</sup> E. Christopher and H. Maxwell Stewart, "Convict Transportation in Global Context 1700-88" in A. Bashford and S Macintyre (eds), *The Cambridge History of Australia*, CUP 2013 at 68, 73.

Procedures that today appear irrational (such as forbidding the accused to give oral testimony on oath) lasted well beyond the criticism by reformers, including Jeremy Bentham and J.S. Mill.<sup>5</sup> Throughout the 19<sup>th</sup> century, despite many calls for reform, some of which were eventually adopted in the great criminal codes exported to countries of the British Empire,<sup>6</sup> the United Kingdom remained resistant. Bentham blamed "Judge & Co" for fighting against reforms, generally with success.

Some reforms reluctantly adopted in elsewhere found their way into the criminal law and practice of the Australian colonies. These included limited systems of appeal by which, at least on issues of law, the trial judge could reserve disputable questions to be resolved by a form of appeal.<sup>7</sup> As well, eventually the prisoner, commonly facing the risk of execution if a jury should return a verdict of guilty, was allowed to give evidence on oath. The jury would hear the prisoner's sworn version of events, if the election was made to give evidence. Before that, the most that was allowed was usually an unsworn statement from the dock – a procedure that persisted for a long time after the alternative became available.<sup>8</sup>

Notwithstanding modest reforms in England, most of which were copied in the Australian colonies, the law and practice in Australia remained tied to the apron strings of the metropolitan power at Westminster. Even when independent dominions of the Crown were established in Canada (1868); Australia (1901); New Zealand (1907); and South Africa (1909), much of the law and many of the procedures remained those still observed in England. Whilst Queensland, Western Australia, Tasmania, and to some extent the Northern Territory of Australia, eventually embraced a criminal code, other jurisdictions continued to apply the common law of crime (especially New South Wales, Victoria and South Australia) and to follow English traditions and procedures, subject to particular statutory variations.

<sup>5</sup> HLA Hart, "Jeremy Bentham" AWB Simpson (ed) *Biographical Dictionary of the Common Law*, Butterworths, London, 1984, 44 at 45. *Ibid*, John Stuart Mill, *loc cit*, 364.

<sup>6</sup> Such as the *Indian Penal Code* of 1860. See Thomas Babington Macaulay in AWB Simpson, above n.5 at 330 and Sir James Fitzjames Stephen, *loc cit*, 486.

<sup>7</sup> This was the procedure of Crown Cases Reserved. It was preserved in *Criminal Appeal Act 1912* (NSW), s5A

<sup>8</sup> *Azzopardi v The Queen* (2001) 205 CLR 50 at [71]-[73]; *GBF v The Queen* (2020) 94 ALJR 1037 at 1041 [21].

When I was taught criminal law in the first year of my law course in Sydney in 1958, the texts that we studied were those written in England by Rupert Cross and Asterley Jones.<sup>9</sup> There was only occasionally a glance at the local statutes that enumerated the crimes punishable and the procedures to be followed in the local jurisdiction.<sup>10</sup>

Against this background, it will be no surprise that, at the time of Australia's federation and political independence, decisions had been taken, copying the United States Constitution and not that of Canada, to leave the bulk of the criminal law as the responsibility of the States and Territories; and not of the Federal Parliament. No national criminal code was adopted. Issues of evidence in criminal trials, criminal procedures and substantive criminal law were thus left to the sub-national jurisdictions concerned. This was another impediment to substantial reform. Because crime was basically regarded as a local matter, change to the law was commonly viewed as controversial. The criminal law was not readily susceptible to change.

One change that was adopted followed, in the manner of those times, a reform to criminal procedure earlier adopted by the British Parliament in 1907. This involved the enactment of a *Criminal Appeal Act* of that year.<sup>11</sup> That Act was designed to provide a larger ambit of criminal appeal involving issues of substantive criminal law; criminal trial procedures; and sentencing, all measured against the risks of illegality and miscarriages of justice. The English Act of 1907 applied initially to England and Wales, but not to Scotland or Ireland. Each of those parts of the United Kingdom had their own criminal laws. In the place of the partial reforms allowing for the reservation of points of law and the issue of a writ of error, the 1907 Act established a new Court of Criminal Appeal with different and larger powers.

Much opposition was voiced by the English judges and by many lawyers at the time about this enactment. It was feared that it would undermine the sanctity and finality of jury verdicts and encourage convicted persons to abuse the facility of appeal.<sup>12</sup> The opponents asserted that wrongful convictions were a rarity in England (and systems derived from England) because of the quality of the judges and the high standard of proof required to establish the guilt of the accused. Others emphasised the need to defend the

finality of criminal proceedings, assertions that this was necessary to the stability of society in matters of great emotion and potential fear and disputation. In part, the resistance to criminal appeals in Britain was also based on the understanding that truly deserving cases could be dealt with by pardons issued by the executive government on behalf of the Crown, as the residual font of mercy.<sup>13</sup>

Despite the opposition, the 1907 Act became law. What is more, legislation "in common form" was quickly copied in many jurisdictions of the British Empire. It was replicated in common legislative language in all of the sub-national jurisdictions of Australia. It had the consequence of enlarging the engagement of the senior judiciary in the criminal law; promoting many common rules to be followed in criminal trials and on appeals; and enhancing respect for criminal law, procedure and evidence as topics worthy of rigorous intellectual analysis. The existence in Canada, Australia, New Zealand, South Africa and other countries (unlike the United States) of a general national final appellate court (subject to the Privy Council) meant that senior judges were frequently engaged in considering the controversies thrown up by the common form of the criminal appeal statute and by the criminal law and procedure itself.

## II. CONTROVERSIAL CRIMINAL PROCEEDINGS

*Notable trials and public parables:* In Australia, although the substantive criminal law was largely expressed in legislation enacted by the sub-national legislatures, the catalogue of criminal offences and many of the rules and procedures governing criminal trials were identical or similar because ultimately derived from the model copied from England. Because, until 1986, appeals could be brought from Australia to the Judicial Committee of the Privy Council, by the special leave of that body, high level judicial rulings in criminal cases became important features of the system.<sup>14</sup> The rapid development of public media, including a national broadcaster for radio and later television (in Australia, the Australian Broadcasting Commission, later Corporation and the Special Broadcasting Service) meant that criminal cases, when deemed newsworthy, were commonly covered throughout the nation. Thus, important cases concerning the trial of Aboriginal (First Nations) accused became hotly debated throughout the Commonwealth.<sup>15</sup> So did issues of sentencing of prisoners and specifically the vexed question of capital

<sup>9</sup> *An Introduction to Criminal Law*, Butterworth & Co, London, 3<sup>rd</sup> Ed, 1953.

<sup>10</sup> In the *Crimes Act 1900* (NSW). See above n.2.

<sup>11</sup> *Criminal Appeal Act 1907* (GB). Cf. *Criminal Appeal Act 1912* (NSW) and similar provisions throughout Australia, described in B. Sangha and R. Moles, *Miscarriages of Justice Australia*, LexisNexis Butterworth, Sydney, 2015. Use of, and practice under, the template provisions differed between the Australian CCAs. See Sangha and Moles, 5 [1.1.1].

<sup>12</sup> Sangha and Moles above n.11, 67 [3.3].

<sup>13</sup> B. Berger, "Criminal Appeals as Jury Control" (2007) *Can Crim L Rev* 1 at 29-31. The history is set out in *R v Pendleton* [2001] 1 WLR 72; [2001] UKHL 66.

<sup>14</sup> *Australia Act 1986* (UK and Cth) s 11(1) (Termination of Appeals to Her Majesty in Council).

<sup>15</sup> See eg *Tuckiar v King* (1934) 52 CLR 334; *Stuart v The Queen* (1959) 101 CLR 1.

punishment.<sup>16</sup> Likewise, controversies surrounding the existence of homosexual offences in one State became national stories in other States.<sup>17</sup> There is something about criminal cases that tended to make them specially fascinating for the media.

The *Criminal Appeal Act 1907*, and its Australian copies, were aimed at reducing the risk of miscarriages of justice. However, because no human system is entirely free from error, it was often possible to attract attention to particular features of widely covered cases in which the risk of error could quite easily be asserted and illustrated so as to make the case of interest to the seemingly insatiable appetite of the public. One of the commonest features of criminal justice, was the abiding fear that an innocent person might have been convicted. Although, since 1984, capital punishment was abolished in all jurisdictions of Australia (and last carried out in 1967), speculation that a particular prisoner had been condemned to serve a lengthy period of imprisonment for a crime that he or she had not committed, was a thought that citizens, if they ever turned their mind to it, would worry about. Judges and other experts might protest that the criminal justice system was designed to eliminate, or greatly reduce, the risk of wrongful convictions. Yet the nightmare remained. The modern media, not always for wholesome reasons, would play upon the nightmare. They would unsettle those who feared that mistakes were common and who believed that more should be done to prevent them occurring or to provide redress where error could be demonstrated.

There have been many vivid cases of alleged miscarriages of justice in Australia that have become fixed in the national psyche. Commonly, they have included some peculiarity or special feature that meant that the case refused to go away, even when the legal process may have been finally spent.

*The Chamberlain case:* One such Australian case led to a number of books, television dramas and a movie in which Meryl Streep, no less, secured an Academy Award nomination in 1989. It was a case that laid down a number of important principles on miscarriages of justice. Whilst camping at Uluru (Ayers Rock), in the centre of Australia, in August 1980, Mrs Lindy Chamberlain reported that her baby daughter Azaria had been taken from the family tent by a dingo (wild dog). The initial inquest accepted the mother's version of events. However, there followed a charge of murder, a trial, conviction, a second inquest, more appeals, a royal commission, ultimate acquittal and a third inquest by a coroner who substituted a verdict of acquittal and an apology to the Chamberlain family. This was issued with an amended Death Certificate.<sup>18</sup> The litigation did

not end until December 2011. But a huge amount of newsprint and media were consumed in debating the issues and contesting all of the steps along the way. From the point of view of criminal practice, the case laid down principles to be observed in the case of claims of miscarriage of justice. The trial of the accused involved controversies over scientific forensic evidence and the ways in which such testimony might be safeguarded, analysed and verified.

*The Mallard case:* Another instance involving the long saga of litigation that was likewise the subject of much coverage in the media, especially in Western Australia. Indeed, after the courts had initially rejected Mr Mallard's complaint of wrongful conviction, it was only because he found supporters in the legislature and in the media that he was able to bring a second challenge to the High Court of Australia that ultimately led to his exoneration.<sup>19</sup>

In 1994 Mr Mallard was convicted of the murder of a jeweller in Perth. His trial lasted 10 days during which his unusual personality became obvious. At the end of the saga it was revealed that he suffered from schizophrenia. Whilst he was under interrogation by the police, he made suggestions about how the murder might have happened. The police evidence was unfair and unreliable. Errors were not corrected by the prosecutor. Mr Mallard's conviction, following the jury verdict of guilty, was confirmed by the Court of Criminal Appeal. Special leave to appeal to the High Court of Australia was refused.

A major element in that appeal had been Mr Mallard's complaint that he had not been subjected to a polygraph test as he had demanded. However, as the reliability of such tests is not generally accepted in Australia, this was an unpersuasive ground to establish a miscarriage. Eventually, after a petition for mercy, the Attorney-General referred the case once again to the Court of Criminal Appeal. That court again dismissed the appeal. However, this time, special leave was granted by the High Court of Australia. The appeal was allowed and the conviction quashed. On his second application to the highest court, Mr Mallard was represented by two very distinguished barristers in the State, one of whom was later appointed Governor of Western Australia and the other a Justice of the High Court.<sup>20</sup>

I participated in the original special leave panel that had rejected Mr Mallard's first application for special leave to appeal to the High Court of Australia. That fact was disclosed on the second application; but no party suggested that I should recuse myself. The arguments this time were substantially different. There was no mention of lie detectors. The new counsel simply analysed the evidence infastidious detail and

<sup>16</sup> *Tait v The Queen* (1962) 108 CLR 620.

<sup>17</sup> *Croome v Tasmania* (1998) 191 CLR 119.

<sup>18</sup> *Chamberlain v The Queen [No.1]* (1983) 153 CLR 514; *Chamberlain v The Queen [No.2]* (1984) 153 CLR 521.

<sup>19</sup> *Mallard v The Queen* (2005) 224 CLR 125; [2005] HCA 68.

<sup>20</sup> Hon. M.J. McCusker QC (Governor of WA 2011-14); Dr James Edelman (appointed to the High Court of Australia in 2017).

demonstrated the virtual impossibility of Mr Mallard's being able to be at the jewellers' shop at the time of the murder, given other objective testimony about his movements in Perth on that day. My own, albeit innocent, involvement in a miscarriage of justice affecting Mr Mallard, has helped to focus my mind on this danger. Judges in appellate courts work under very great pressure. Generally, they share the burden. They are therefore highly dependent on the time, expertise and perceptiveness of the judges rostered to participate. If I had enjoyed the time to conduct for myself the detailed examination of the evidence performed by counsel in the second appeal, I might have spared Mr Mallard eight years of unwarranted imprisonment.

Subsequently, a judicial commission of inquiry, investigating other evidence, concluded affirmatively that the murder of the jeweller had been the work of another prisoner. The Mallard case showed that even conscientious judges, observing high standards, can make errors and miss points. This is a lesson I have never forgotten. I have shared it with judicial colleagues so that all will be conscious of the risks of miscarriage and of the need for institutional improvements. Mr Mallard, like Mrs Chamberlain, was awarded monetary compensation for wrongful conviction. Sadly, he was later struck down and killed on a highway which would not have happened if he had remained in prison.

*The case of Cardinal Pell:* A third instance where a sensational trial miscarried in Australia was the trial Cardinal George Pell for alleged historical sexual offences. The cardinal, who had been Archbishop of Melbourne and later Sydney, drew worldwide headlines after a jury in the County Court of Victoria, at a trial in 2018, returned guilty verdicts for alleged sexual offences against a male child under the age of 16 years.<sup>21</sup> The relevant offences were alleged to have occurred at St Patrick's Cathedral, Melbourne in December 1996. The trial did not take place until 22 years later. The accused did not give evidence at his trial before the jury. His defence was an assertion of innocence, a recorded statement of denial to the investigating police, available at the trial and appeal, and the testimony of several church and other witnesses said to combine (even allowing for an apparently credible complainant) to make the charges inherently impossible or so unlikely as to oblige acquittal.<sup>22</sup>

Inferentially, the jury accepted the prosecution's case. They rejected the accused's defence at his trial. They must have accepted the complainant. They entered verdicts of guilty, resulting in the conviction of the cardinal. He was sentenced to imprisonment; began

servicing his sentence; and immediately lodged an appeal.

On appeal, the Court of Appeal of Victoria, effectively a court of criminal appeal for that State, rostered the Chief Justice, the President and a Senior Judge of Appeal with great criminal law expertise (Weinberg JA) to hear the proceedings. By majority, with Weinberg JA dissenting, the cardinal's appeal was dismissed. The conviction was confirmed. The cardinal was returned to prison. He immediately sought special leave to appeal to the High Court of Australia. That court heard his appeal in March 2020. In April 2020, three weeks later, it delivered a unanimous decision, setting aside the convictions and substituting a judgment of acquittal in favour of Cardinal Pell.<sup>23</sup> He was released at once. He later returned to Rome. Pope Francis noted that he had always asserted his innocence.<sup>24</sup>

In announcing its decision, the High Court of Australia went through, in great detail, the factual evidence that had been presented at the trial. It listed, the testimony such as was unchallenged. It concluded, in a single unanimous opinion of the entire court, that the jury, acting rationally, was obliged to "have entertained a doubt as to the applicant's guilt".<sup>25</sup> The Court went on:<sup>26</sup>

"Making full allowance for the advantages enjoyed by the jury, there is a significant possibility in relation to [the] charges... that an innocent person has been convicted."

In reaching its conclusion, the Court relied on, and applied, a passage from the earlier decision in *Chamberlain v The Queen [No.2]*<sup>27</sup> expressed by Deane J (then in dissent with Murphy J writing separately). That ruling has subsequently been followed and applied in later decisions of the High Court of Australia.<sup>28</sup> The court insisted that this was not substituting a trial on the facts by appellate judges for the "constitutional" mode of trial by a jury of twelve citizens. It was simply giving effect to the protections afforded in the *Criminal Appeal Act* template against a "real possibility" of the conviction of an innocent accused.

It will remain to be seen whether the strong observations in *Pell v The Queen* flow on for the protection a whole range of prisoners, many like Mr Mallard with mental health issues, who present very detailed arguments on the facts at their trials and ask for the same attention to the copious details of the

<sup>23</sup> (2020) 94 ALJR 394. [2020] HCA 12.

<sup>24</sup> *The Guardian*, "Pope Francis decries unjust sentences after Cardinal George Pell acquitted", 7 April 2020.

<sup>25</sup> *Ibid.*, (2020) 94 ALJR 394 at 412 [119].

<sup>26</sup> *Ibid.*, at 413 [119].

<sup>27</sup> (1986) 153 CLR 512 at 618-619 per Deane J.

<sup>28</sup> *Chidiak v The Queen* (1991) 171 CLR 432 at 444 per Mason CJ; *M v The Queen* (1994) 181 CLR 487 at 4494, per Mason CJ, Deane, Dawson and Toohey JJ. See also *Pell v The Queen* (2021) 94 ALJR 394 at 397 [9].

<sup>21</sup> High Court of Australia, 24 October 1997, noted (1997) 191 CLR 646 (Toohey, McHugh and Kirby JJ).

<sup>22</sup> *Pell v The Queen* [2019] VSCA 186 (CA).

evidence. Because justice is expected to be blind as to the personalities who appear before the judgment seat, it must be hoped and expected that the central principle in Cardinal Pell's case will afford all prisoner applicants the prospect of the same vigilance against the *possibility* (not *probability*) of innocence that was evident in *Pell v The Queen*. Certainly, the strong and unanimous reasoning of the High Court of Australia in Cardinal Pell's case shows the importance of appellate courts, including the final national court, fulfilling the role of an institutional safeguard against the risk of the conviction of an innocent accused. Institutional protections against the risk of such miscarriages of justice are vital both for a prince and a pauper.

### III. TEMPLATE APPEALS TO CCA

*A single right to appeal:* I will now identify three particular issues which have intervened to limit the capacity of courts of criminal appeal to protect possibly innocent prisoners from the risks of a miscarriage of injustice.

The first does not concern itself with the grounds of appeal but with the legal right of appeal against criminal conviction in the language in which that right has been expressed in the 1907 Act and its Australian copies.

In the United Kingdom, as in Australia, the prevailing view has been, from the beginning, that the common form legislation afforded a convicted prisoner but a single right to appeal. In a number of cases judges held that, appeal, being a creature of statute, there were no rights of appeal beyond those that had been expressly granted by the legislature. Moreover, they held that a proper examination of the common form statutory provision resulted in a conclusion that it gave rise to one right only to make an appeal.<sup>29</sup> Once that privilege was exercised, the power and jurisdiction of a court of criminal appeal to entertain an appeal were exhausted. Occasionally, judges, including myself, have expressed doubt that this was a correct construction of the statute.<sup>30</sup> The usual reason given for favouring a limitation to one appeal (which is not expressly spelt out, in terms, in the statute) was that an appellate court "should not attempt to enlarge its jurisdiction beyond what Parliament has chosen to give".<sup>31</sup>

The problem with this interpretation of the legislation is that it was not the only possible interpretation of to the language used by Parliament. That language was facultative and beneficial. It was not restrictive. The Act simply stated that a person 'may appeal'. It then specified the grounds upon which such

an appeal might be brought. The restriction on the *number* of appeals that might be initiated appeared to have had its origin in the judicial distaste for an expansion of appellate rights for convicted prisoners. So much had been evident from the start, before and after the enactment of the *Criminal Appeal Act 1907*. This judicial hostility continued despite the increasing evidence of the utility of the appeal right both in the United Kingdom and in derivative jurisdictions.

Against the background of this restrictive interpretation of the availability of the right to appeal, the High Court of Australia also held that it was itself unable to receive a second application by a person claiming to have been wrongly convicted. In this respect, the High Court affirmed the approach adopted by intermediate courts to the effect that they did not enjoy a right to reopen an appeal or to hear a further appeal or application for that purpose.<sup>32</sup> Additionally, for constitutional reasons, the High Court of Australia took the view that it could not admit fresh evidence in an "appeal", even though such evidence might tend to demonstrate that the applicant had been wrongly convicted.<sup>33</sup> This was an additional view about confining the facility for reopening criminal appeals with which I disagreed. I pointed out that, as a consequence, "Justice in such cases is truly blind. The only relief available is from the Executive Government or the media – not from the Australian judiciary".<sup>34</sup> Such a position appeared unsatisfactory.

The High Court of Australia does enjoy a statutory power to remit a matter before it to another court to consider admitting fresh evidence and then to refer the matter back to the High Court for final determination. That power still exists. However, it has seldom been exercised. It gives rise to its own complications.<sup>35</sup> If the High Court of Australia, in the *Postiglioni* case, had taken the view about the availability of a second appeal, in cases of demonstrated merit where the prisoner could, by leave, convince an appellate court to grant such leave for a second or further time, many of the problems that have emerged in Australia might have been solved. The contrary decision was not unarguable. However, when the decision was made in the High Court of Australia (and never reversed in later cases) it was inevitable that reformers would endeavour to overcome this impediment by statutory reform. This is what has happened in Australia. It has led to amendments in a number of jurisdictions; yet so far not universally.

<sup>29</sup> *Grierson v The King* (1938) 60 CLR 431; [1938] ALR 460; Sangha, Moles, above n.11, at p 70.

<sup>30</sup> *Mickelberg v R* (1989) 167 CLR 259; 86 ALR 321; [1989] HCA 35; M.D. Kirby, "The mysterious word "sentences" in s73 of the Constitution" (2002) 76 ALJ 97.

<sup>31</sup> M.D. Kirby, "Black and White Lessons for the Australian Judiciary" (2002) 23 *Adel L Rev* 195 at 206.

<sup>32</sup> The power is contained in the *Judiciary Act 1903* (Cth) s44.

<sup>29</sup> *Burrell v The Queen* (2008) 238 CLR 218; 248 ALR 428; [2008] HCA 34; *R v GAM* (No 2) (2004) 9 VR 640 (CA); [2004] VSCA 117.

<sup>30</sup> See *Postiglione v The Queen* (1997) 189 CLR 295 at 305, per Dawson and Gaudron JJ; and at 331, per Kirby J, at 345.

<sup>31</sup> *R v Edwards* [No J] [1931] SASR 376 at 380.

*Ministerial referral to court:* There was a further initiative adopted in the *Criminal Appeal Act 1907*. It allowed an applicant, after exhausting the right to appeal, to apply to the attorney-general for the reference of the question of a possible miscarriage to the appellate court, to be heard as an appeal. However, this exceptional procedure depended in the first instance upon action not by the judiciary but by the relevant executive government.

Given that a manifestation of that government was usually the agency responsible for prosecuting, incarcerating and resisting the complaints of the accused, the defects of this “fail-safe” procedure were clear, including to the prisoner concerned. It presented the arguable existence of a conflict of interest and duty. In *Von Einem v Griffin*, the South Australian Full Court stated that the power of statutory referral following such a petition, provided ‘no legal rights’ as such to the applicant merely a privilege.<sup>36</sup> It also stated that the Attorney-General had a ‘complete discretion’ in the matter.<sup>37</sup> In fact, it emphasised that the power did not have to be exercised at all.<sup>38</sup> It held that the decision processes of the Attorney-General were not subject to judicial review.<sup>39</sup> Some of these judicial dicta were written before more recent authority has clarified the ambit of judicial review in such matters.<sup>40</sup> The notion that an official, exercising powers derived under legislation, enjoys a completely unfettered, subjective discretion may be inconsistent with the requirements of the rule of law,<sup>41</sup> which Justice Dixon described in the *Australian Communist Party Case*, as a basic principle of Australian constitutionalism.<sup>42</sup> However, the net effect of the foregoing decisions has been that a person, claiming to have been wrongly convicted, might end up in a legal blind alley. The prisoner was obliged to seek redress from the Attorney-General. Yet that is the very office-holder who has ultimate responsibility for the agencies (such as forensic sciences, police, prosecutions and the courts) that may be the obstacle to the grant of the relief that the prisoner seeks.

It was in this context that those pressing for legislative reform in South Australia presented a submission to the Australian Human Rights Commission complaining about the situation that they faced.<sup>43</sup> The

submission included the complaint that the Australian criminal appeal provisions did not properly protect the right to a “fair trial” or the right to an effective “appeal”. The right to “appeal” is mentioned in the *International Covenant on Civil and Political Rights* (ICCPR), art. 14.5. Australia is a party to that *Covenant* and to the *Second Optional Protocol*. Under the latter, persons in Australia, who are adversely affected, enjoy a right of communication to the Human Rights Committee (HRC) of the United Nations. The HRC pointed out that the ICCPR requires that such rights be determined by competent ‘judicial’ authorities, applying established legal rules in a ‘fair and public hearing’. An ‘unfettered’ executive discretion would not conform to the requirements of the *Covenant*. It was not a ‘judicial’ decision. It took place behind closed doors. These were defects provided by the *Criminal Appeal Act* procedures. The same defects would appear to exist in the special inquiry procedures provided in New South Wales and the Australian Capital Territory.<sup>44</sup>

*Reform in South Australia:* The occasion for the 2013 South Australian reform was a Bill, introduced into the State Parliament, designed initially to create a Criminal Cases Review Commission (CCRC) for that State.<sup>45</sup>

The proposal that a CCRC should be created for did not enjoy the support of the then Government of South Australia or of its Attorney-General. Nonetheless, upon receiving the Bill, the Parliament of South Australia referred the Bill to a Legislative Review Committee. That Committee invited public submissions. By that stage, in November 2011, the Australian Human Rights Commission (AHRC) had completed its report concerning the compliance of the then criminal appeal model with Australia’s obligations under the ICCPR. In the report of the AHRC, it stated:

“The Commission is concerned that the current systems of criminal appeals in Australia, including in South Australia, may not adequately meet Australia’s obligations under the ICCPR in relation to the procedural aspects of the right to a fair trial. More particularly, the Commission has concerns that the current system of criminal appeals does not provide an adequate process for a person who has been wrongfully convicted or who has been the subject of a gross miscarriage of justice to challenge their conviction.”<sup>46</sup>

In the result, the South Australian Legislative Review Committee did not recommend the establishment of a CCRC for the State. However, it did make three important recommendations. These remain

<sup>36</sup> *Von Einem v Griffin* (1998) 72 SASR 110; [1998] SASC 6858.

<sup>37</sup> *Von Einem* at [121].

<sup>38</sup> *Von Einem* at [150].

<sup>39</sup> *Von Einem* at [151].

<sup>40</sup> See e.g. *Gerlach v Clifton Bricks Pty Ltd* (2002) 209 CLR 478 at 503-504 [70]; [2002] HCA 22. Cf *FAI Insurances Ltd v Winneke* (1982) 151 CLR 342.

<sup>41</sup> Sangha, Moles above n.11, at p 53 citing French R, AC, Chief Justice, ‘The Rule of Law as a Many Coloured Dream Coat’ Singapore Academy of Law 20<sup>th</sup> Annual Lecture, 18 September 2013 p 13.

<sup>42</sup> *Australian Communist Party v The Commonwealth* (1951) 83 CLR 1 at 193.

<sup>43</sup> The Submission is available at <http://netk.net.au/HumanRights/HREOCComplaint.pdf>

<sup>44</sup> The provisions are set out in detail at Sangha, Moles, above n.11, 3.5.

<sup>45</sup> The current figures are available at <https://ccrc.gov.uk/case-statistics/>

<sup>46</sup> 25 November 2011, Australian Human Rights Commission Submission to the Legislative Review Committee of South Australia, Inquiry into the Criminal Cases Review Commission Bill 2010, at 6.2. available at <http://netk.net.au/CCRC/AHRCSubmission.pdf>

relevant to the situation in other jurisdictions of Australia today.

The first recommendation was that a Forensic Review Panel should be established, which should have the capacity to review cases in which it was alleged that a wrongful conviction had resulted from incorrect or inadmissible forensic evidence. This panel should have the capacity to refer such cases to the appeal court of the State for review. In effect, this would amount to a kind of CCRC for the State; but restricted to miscarriages based on forensic evidence.

Under current legal arrangements in Australia, a special inquiry may be established under legislation applicable in New South Wales and the Australian Capital Territory. In the other jurisdictions, the Executive Government may establish a Royal Commission, including one addressed to forensic evidence. This is what had occurred in the cases of *Lindy Chamberlain* in the Northern Territory and *Edward Splatt* in South Australia.<sup>47</sup> However, such inquiries are extremely costly. They consume considerable time and large public resources. The *Eastman* inquiry, that followed trials after the murder of a police commissioner in the Australian Capital Territory, also was said to have cost that jurisdiction approximately \$12 million.<sup>48</sup> The *Splatt* Royal Commission hearings lasted 196 hearing days. Its cost to the South Australian Treasury was also formidable.

The second recommendation of the South Australian Legislative Review Committee was that there should be a general inquiry into the use of forensic evidence in criminal trials in the State. This suggestion has now been taken up by the Attorney-General for Victoria.<sup>49</sup> She, in turn, was picking up concerns that had been expressed by Justice C.M. Maxwell, President of the Court of Appeal of Victoria.<sup>50</sup> He had expressed the view that there was little proof that several forensic techniques used in Australia, including gunshot analysis, footprint analysis, hair comparison and bite mark comparison, reliably identify the guilty in criminal trials. Justice Maxwell called on governments throughout Australia to oblige judges to consider the established reliability of forensic evidence before it was made available to juries.

<sup>47</sup> Details of the Chamberlain inquiry are available at <http://netk.net.au/NTHome.asp>. Details of the Splatt inquiry are available at <http://netk.net.au/SplattHome.asp>

<sup>48</sup> The *Eastman* Inquiry arose following *Eastman v The Queen* (1989) 171 CLR 506; *Ex parte Eastman* (1999) 200 CLR 322; *Eastman v The Queen* (2000) 203 CLR 1; and *Eastman v Direction of Public Prosecutions* (ACT) (2003) 214 CLR 318; <http://netk.net.au/NewZealandHome.asp> and details of the UK CCRC are available here <http://netk.net.au/CCRCHome.asp>

<sup>49</sup> 10 October 2019, *The Age*, 'Attorney-General calls for inquiry over fears of innocent people being jailed' available at <http://netk.net.au/Forensic/Forensic57.pdf>

<sup>50</sup> C.M. Maxwell, "Preventing Miscarriages of Justice: The Reliability of forensic Evidence and the Role of the Trial Judge as Gatekeeper", (2019) 93 ALJ 642.

These concerns were supported by a leading scientist at the Victorian Institute of Forensic Medicine.<sup>51</sup> The concerns drew support from a report of the National Academy of Sciences in 2009 as well as a 2019 Update of that report which found that, of all of the forensic sciences now in use, DNA analysis was the only one which had the capacity for regular reliable validation of results. All others, it was held, involved elements of subjectivity that made the findings unreliable or certainly doubtful.<sup>52</sup>

In 2012, the National Institute of Science and Technology in the United States reported that latent fingerprint analysis gave rise to similar concerns as to reliability. In 2015, another major report in the United States on hair analysis, concluded that, in over 90% of cases involving such analysis, the evidence probably overstated the significance of microscopic hair comparisons. In a significant number of such US cases, the accused had been sentenced to death. Given the practical impossibility of juries making reliable assessments of their own about the acceptability of most forms of forensic evidence, Justice Maxwell called for exploration of the ways by which judges, court rules and trial processes could protect the integrity of criminal trials involving forensic evidence.<sup>53</sup> These recommendations remain a work in progress in Australia.

The third recommendation in South Australia was for the enactment of a right to a second or further appeal where fresh and compelling evidence was presented to the effect that there had been a substantial miscarriage of justice at the first trial. This was the recommendation that gave rise to the amendment to the South Australian law that was enacted by the State Parliament in May 2013.

#### IV. LEGISLATIVE RIGHT TO SECOND APPEAL

During the course of the parliamentary debate about a possible right to a second appeal in South Australia, the Attorney-General of the State ultimately conceded that it was inappropriate for such applications to be decided behind closed doors, as the petition procedure envisaged. He stated that the public forum of the courts was the appropriate place where which such issues should be resolved.<sup>54</sup> In the Legislative Council of South Australia, a statement that I had provided in support of the measure was read on to the record by the Hon. Anne Bressington MLC, the sponsor

<sup>51</sup> 3 September 2019, *The Age*, 'Top CSI scientist says police ignoring evidence flaws, jailing the innocent' available at <http://netk.net.au/Forensic/Forensic53.pdf>

<sup>52</sup> Links to this and the other reports referred to are available at <http://netk.net.au/ForensicHome.asp>

<sup>53</sup> Maxwell, above n. 50 at 652-654.

<sup>54</sup> 7 February 2013, House of Assembly, Statutes Amendment (Appeals) Bill, the Hon J R Rau, Attorney-General, available at <http://netk.net.au/Appeals/Appeals6.asp>

of the Bill. In that statement I sought to identify what might explain the reasons for the longstanding official hostility to such a measure:<sup>55</sup>

“The desire of human minds for neatness and finality is only sometimes eclipsed by the desire of human minds for truth and justice. There will always be a disinclination to reopen a conviction, particularly where it has been reached after a lengthy criminal trial and a verdict of guilty from a jury of citizens. Sometimes, however, that disinclination must be confronted and overcome with the help of better institutions and procedures than we have so far developed in Australia.”

Eventually, the South Australian legislature enacted a provision permitting a further right of appeal against a criminal conviction or sentence notwithstanding an earlier appeal. Tasmania and Victoria later followed South Australia in enacting a similar law.<sup>56</sup> Western Australia has such a law under consideration.

However, progress towards this reform remains glacial in other sub-national jurisdictions. No initiative has been commenced in New South Wales, Queensland or either of the mainland Territories of Australia. It seems inherently unlikely that these Australian jurisdictions are immune from the risks of miscarriages of justice accepted to exist in South Australia, Tasmania and Victoria. In the event, one argument that proved most persuasive for the advocates of reform and gained unanimous support in the South Australian Review Committee. This pointed to provisions enacted by all Australian legislatures, notwithstanding an earlier *acquittal*, whereby a prosecutor was permitted to apply to the court for permission to commence a further prosecution based on fresh and compelling evidence of guilt. The South Australian Committee reasoned that it would only be just and equitable to allow a person *convicted* of a serious crime to seek a like permission for reconsideration of the case where there was supporting fresh and compelling evidence of a wrongful conviction. Why this argument has not so far attracted support in the remaining Australian jurisdictions is difficult to imagine. It shows the consequences to which “democratic” politics, repeated ‘law and order’ electoral campaigns, and occasional media hysteria have driven Australian criminal law and practice towards the ethical bottom.

In the nine years since the law on criminal appeals was amended in South Australia, there have been a number of cases that have given rise to applications for further appeal. Of those applications, at least three have been successful. These led to

convictions being overturned, two of them on the basis of established flaws in the forensic evidence admitted at trial.<sup>57</sup> None of these cases has resulted in the conduct of a retrial, still less further convictions.

Of the three unsuccessful appeals in South Australia, one was granted special leave to appeal by the High Court of Australia. In that case it was found that some of the forensic evidence received at the trial was unreliable. However, in the opinion of the High Court, the defects in the evidence were insufficient to warrant allowing the appeal and setting aside the conviction.<sup>58</sup> The utility of the reformed procedure is nevertheless demonstrated by the outcome in half of the cases decided. It is not undermined by a small number of cases where the application was refused, in some of them by majority and with apparent hesitation.

The most significant of the successful South Australian cases since the second appeal was allowed was that of Mr Henry Keogh. He had already served over 20 years in prison for the murder of his fiancée. He had always denied his guilt. It had been alleged that he had drowned her in a domestic bath. Before the law on appeals was changed, there were a number of requests for referral of his case to the appellate court under the petition procedure then applicable. All of these requests were rejected by the relevant Minister. Following the reform of the law, Mr Keogh’s application for leave to appeal was brought to, and granted by, the Full Court of the Supreme Court of South Australia. Mr Keogh’s conviction was set aside, and he was released.

Not until his appeal was lodged under the new procedure did the Director of Public Prosecutions of South Australia produce a forensic report of 2004 that had been obtained by the State Solicitor-General nine years earlier. This forensic report was only released to the applicant’s advisers on 5 December 2013.<sup>59</sup> The report proved to be a significant consideration in the Full Court’s reasoning upholding Mr Keogh’s appeal. No explanation has thus far been released as to why the 2004 forensic report was not made available to the prisoner under the former petition procedure, having regard to the Crown’s duty of disclosure of relevant material in its possession.<sup>60</sup> Nor was an explanation given as to why the relevant Minister, based on that report, had refused to refer the matter to the Court under the then petition procedure.

<sup>55</sup> 19 March 2013, Legislative Council, Statutes Amendment (Appeals) Bill, available at <http://netk.net.au/Parliament/LC16.asp>

<sup>56</sup> The Act, and Parliamentary debates in Tasmania are available at <http://netk.net.au/TasmaniaHome.asp>. Those in Victoria are available at <http://netk.net.au/VictoriaHome.asp>.

<sup>57</sup> *R v Drummond (No.2)* [2015] SASCFC 82 involved a forensic scientist mis-stating the probabilities in relation to possible DNA transfer during an attempted abduction.

<sup>58</sup> *Van Beelen v The Queen* (2017) 91 ALJR 1244 affirming the majority orders of the Full Court of the Supreme Court of South Australia (2018) 125 SASR 253 (Kourakis CJ dissenting); [2017] HCA 48 (8 November 2017).

<sup>59</sup> *R v Keogh (No.2)* [2014] SASCFC 136 at [18].

<sup>60</sup> *Mallard v The Queen [No.2]* (2005) 224 CLR 125 at 145-157 [55]-[89]; [2005] HCA 68.

The conclusion is that, but for the reform enacted by the Parliament of South Australia affording a right of second appeal, it is likely that the forensic report would never have seen the light of day. Mr Keogh would probably still be in prison on a conviction that he contested, based on yet another instance of suspect forensic evidence.

## V. CRIMINAL CASES REVIEW COMMISSIONS

*United Kingdom CCRC:* To secure further change to appellate arrangements after 1907, following so much controversy and dispute, required something dramatic to occur. That happened in a form of a series of cases heard in British courts involving mostly Irish offenders convicted of IRA bombing crimes.

In 1980, the so-called *Birmingham Six* sought to pursue the West Midlands Police. Lord Denning said that to allow evidence that police had framed innocent people would be "such an appalling vista that every sensible person in the land would say: it cannot be right that these actions should go any further". This ruling meant that the six prisoners had to spend 10 further years in prison before they were eventually freed. The Irish cases in which the complaints of the prisoners were ultimately accepted caused shock and distress in the United Kingdom. They resulted in the conviction that institutional change was imperative.<sup>61</sup>

In 1991 the British Government established a royal commission to undertake a fresh review of the criminal justice system in England and Wales. The commission was chaired by Viscount Runciman. It comprised ten members.<sup>62</sup> Its report specially targeted what it saw as defects in the existing arrangements for investigating alleged miscarriages of justice after the established right to appeal had been exhausted.

The commission was especially concerned about the dangers of the conviction of the innocent. It suggested that the Court of Appeal should take a more liberal approach to what constituted "fresh evidence" and should be more willing to quash convictions because of concerns about their "safety". It also recommended improvements in the audit and quality control of forensic sciences, increasingly important in securing criminal convictions. And it recommended the establishment of a new statutory body (the Criminal Cases Review Commission (CCRC)). This was to operate independently of the executive and the judiciary.<sup>63</sup> That recommendation was eventually

accepted by the British Government in 1995. The CCRC was set up in 1997. It was empowered to consider complaints of miscarriages of justice; to arrange for their full investigation; and where it so decided, to refer the case to the Court of Appeal. The criterion for reference was where the CCRC considered that "there is a real possibility that the conviction, verdict, finding or sentence would not be upheld, were the reference to be made".<sup>64</sup>

In "exceptional circumstances" such a reference could be made although the applicant was unable to demonstrate "fresh evidence" or argument, previously unavailable. The CCRC was empowered to appoint its own investigating officers. The Court of Appeal was empowered to seek special assistance from the CCRC to investigate and report back on an issue in an appeal. At first, the commission received an average of 1,000 applications a year. This number later rose to 1,500 applications a year. They covered the whole range of criminal convictions: recent and very old; minor and very serious.<sup>65</sup>

The creation of this supplementary institution acknowledged the defects and inadequacies that had been demonstrated in the operation of the appellate provisions of the 1907 Act over the preceding ninety years. In effect, the initiative accepted the institutional defects inherent in a system of courts of criminal appeal. Those defects arose, in part, from the over heavy workload and limited powers of the courts. But they also reflected concern, implicit though not express, about the mindset of the approach of some judges to the task of determining criminal appeals. The primacy of the judges and of the Court of Appeal were to be preserved, upon the establishment of the CCRC. Specifically, this was to be done by the requirement that any disturbance of a conviction, ruling or sentence was still be reserved to the court not the commission. The CCRC was to be supported in its work by police, lay, legal and other expert staff, with an institutional mandate to re-examine suspect cases deemed appropriate for such attention.

The CCRC in the UK started work in April 1997. Between then and the end of April 2019 it has, according to its website: "Referred 760 cases to appeal courts; of the 689 cases where appeals have been heard by the courts, 466 appeals have been allowed and 210 dismissed; 589 cases are currently under review at the Commission and 115 are awaiting review. So far we have received a total of 27,235 applications (including all ineligible cases) and completed 26,530 cases."<sup>66</sup>

A number of the cases referred by the CCRC involved concerns about forensic evidence. A number

<sup>61</sup> *R v Maguire* (1991) 94 Cr App ER 133 ("Maguire Seven"); *R v Richardson* (EWCA-Criminal Division) 20 October 1989 (unreported); *R v McKenny* (1991) 93 CrAppR 287 ("Birmingham Six"); *Ward v R* (1993) 96 CrAppR 1.

<sup>62</sup> W.G. Runciman, *The Report of the Royal Commission on Criminal Justice*, HMSO, Cm 2263, 1993. See now, Michael Naughton (ed.) *The Criminal Cases Review Commission: Hope for the Innocent?*, Palgrave Macmillan, London, 2009.

<sup>63</sup> *Criminal Appeal Act 1995* (GB), s8.

<sup>64</sup> *Ibid*, s13. See Sangha and Moles above n.11, 484-5 [12.9.2].

<sup>65</sup> *Ibid*, 486 [12.9.2].

<sup>66</sup> See [www.ccr.gov.uk/case-statistics](http://www.ccr.gov.uk/case-statistics) (accessed 30 April 2019).

of them related to sudden infant death and 'shaken baby syndrome'.<sup>67</sup> Other cases involving forensic evidence have extended to 'firearm residue', 'blood stain pattern analysis' and forensic pathology and medicine.<sup>68</sup> Many cases reflected concerns about the reliability of forensic sciences, as well as the safeguarding of evidence and integrity of expertise. Concerns of this kind have arisen in many 'suspect cases'.<sup>69</sup> As criminal prosecutions increasingly rely on scientific and technological evidence, safeguards that are new, vigilant and more appropriate are needed to prevent miscarriages.

The CCRC has attracted critics. They have suggested that it should be willing to refer more cases to the Court of Appeal on the "real possibility" test, notwithstanding the consequence that this involves the prospect of overturning jury verdicts.<sup>70</sup> In the first triennial review of the CCRC in 2013, the United Kingdom Government concluded that the CCRC was functioning as was to be expected.<sup>71</sup> Its performance, now extending to England, Wales and Northern Ireland, had to be independent of both the judicial and executive arms of government. As well, it had to be perceived to be independent if it were to gain public and stakeholder support. Whilst media critics have sometimes suggested that the CCRC was the "lap dog"<sup>72</sup> of the Court of Appeal, the statistics of the commission suggest that it is picking up many more cases of miscarriages of justice than the initial CCA model had done. An indication of the broad acceptance of the role, necessity and general success of the CCRC may be seen in the establishment of a similar but smaller CCRC for Scottish cases. It commenced operations in April 1999.<sup>73</sup>

*New Zealand CCRC:* Based on the operation of the United Kingdom commissions, the Parliament of New Zealand in 2020 established a CCRC for that country. It is based on the model of the CCRC in Britain. It allows any person convicted of a crime in a New Zealand court who believes that they have suffered a miscarriage of justice in their conviction or sentence, or both, to apply to the New Zealand CCRC for an independent review of their case.

The New Zealand Commission was established by legislation in 2020.<sup>74</sup> It is an independent Crown Entity. It employs staff with varied backgrounds and expertise. If it considers a miscarriage of justice may

have occurred ("possibility"), the New Zealand CCRC may refer the case back to the appeal court. Moreover, it replaces the referral function previously performed by the Governor-General of New Zealand in the exercise of the Royal Prerogative of Mercy. The website of the New Zealand CCRC states that it is established on the basis of models created in the United Kingdom and Scotland. The Chief Commissioner of the CCRC in New Zealand, Mr Colin Carruthers QC, was appointed from 1 February 2020 for an 18-month term. The CCRC was established in Hamilton, apparently to emphasise its independence "from the big bureaucratic and judicial centres, Auckland and Wellington".<sup>75</sup> The statistics on its operation are not available at this time of writing.

*Canadian CCRC:* On 16 December 2019, the Prime Minister of Canada (Rt Hon. Justin Trudeau) announced the intention of his newly re-elected government to propose to Parliament the establishment of a Canadian CCRC.<sup>76</sup> He said that it would "make it easier and faster for potentially wrongfully convicted people to have their applications reviewed". The Minister of Justice of Canada has appointed the hon Harry LaForme (first Canadian Indigenous judge and former Justice of the Ontario Court of Appeal and the Hon. Juanita Westmoreland-Treoré (former Justice of the Court of Quebec) to conduct consultations on the creation mandate and structure of the CCRC. However, it appears to be following the United Kingdom concept and the tradition followed after the passage of the 1907 template for the creation of courts of criminal appeal in English-speaking countries.

*Australian CCRC:* Although law reform proposals for the creation of an Australian CCRC have been made, so far, no such body has been established. When the legislation for the improvement of criminal appeals was introduced into the South Australian Parliament in 2015, a suggestion was made for the creation of a CCRC for that State. Although this was discussed in Parliament, it did not proceed. Inferentially, this was because of concerns about cost and need and because of the acceptance of the initiative to permit a further right of appeal in limited criminal cases. The initiation of that right in South Australia was itself contested and initially opposed by the Government of the day. It was an initiative advanced by an independent member of the South Australian Parliament whose perseverance ensured success. However, the reformist inclination was apparently then exhausted by the adoption of the modest reform enacted.

The institutional defect that led in the United Kingdom to the creation of its CCRCs has, not so, far

<sup>67</sup> See Sangha and Moles, above n.11, 486 [12.9.2].

<sup>68</sup> Sangha and Moles, above n.11, 486-7 [12.9.2].

<sup>69</sup> Such as *Stuart v The Queen* (1959) 101 CLR 1 (Aboriginal tracker) and *Chamberlain v The Queen* (paint and blood samples).

<sup>70</sup> Sangha and Moles, above n.11, 488 [12.9.5].

<sup>71</sup> UK Ministry of Justice, Triennial Review of CCRC, June 2014.

<sup>72</sup> *The Independent*, 22 March 2015. See Sangha and Moles 490, above n.11, [12.9.5].

<sup>73</sup> *Crime and Punishment (Scotland) Act 1997* (UK), s523.

<sup>74</sup> *Criminal Cases Review Commission Act 1997* (NZ).

<sup>75</sup> Hon. Andrew Little, Minister for Justice, Statement, 21 February 2020.

<sup>76</sup> <https://www.newswire.ca/news-releases/minister-of-justice-and-attor-ney-general-of-canada-takes-important-step-toward-creation-of-an-inde-pendent-criminal-case-review-commission-851866349.html>

stimulated a similar momentum in Australia. This fact caused the present writer, in an editorial in the *Criminal Law Journal*, to raise the question: "Whether the South Australian model is an adequate response to the problem of wrongful convictions in Australia".<sup>77</sup> It was suggested that the answer to that question was "clearly not".

Recent cases in Australia, including some following the facility of further appeals and scholarly commentary on the topic have demonstrated an important institutional defect that needs addressing. It cannot be suggested that the needs that have led to the creation, or intended creation, of CCRCs in New Zealand and Canada are completely absent in Australia. On the contrary, those needs are plainly present, at least to the same degree. They are palliated by the provision of a new additional right of appeal in exceptional cases; but then in only three States. Such further rights of appeal do not confront the institutional defects of overworked judges; hostile or unsympathetic professional mindsets, excessive professional dedication to finality; and apparent indifference to, or acceptance of, some cases of wrongful conviction as "inevitable", "inescapable" and therefore "tolerable". Such indifference was reduced but not fully addressed by the criminal appeal template of 1907.

There is a need in Australia, for greater concern and vigilance about the risk of miscarriages of justice. As *Chamberlain*, *Mallard*, *Pell* and other highly publicised cases show, courts of criminal appeal can sometimes rise to the challenge and afford much needed redress. The CCA institution then works as it should. But sometimes they fail. The statistics in the performance of the differently organised, non-judicial institutions of the CCRCs in the United Kingdom suggest that there is a gap in Australian criminal law and practice and in our institutional arrangements that is not being met. Seemingly, addressing this institutional defect is not even presently on the horizon. This says something about the tolerance in Australia of a proportion of people who may possibly be innocent of the crimes of which they have been convicted but who cannot secure relief. There is thus an apparent disharmony between the very high standard expressed by the High Court of Australia in *Pell v The Queen* and the somewhat lower standard tolerated by politicians, legislatures and citizens concerning the enactment of institutions that will uphold the higher standards. It is imperative that this disparity should be remedied without delay.

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<sup>77</sup> M.D. Kirby, "A New Right of Appeal as a Response to Wrongful Convictions: Is it Enough?" (2019) 43 *Crim LJ* 299.

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GLOBAL JOURNAL OF MANAGEMENT AND BUSINESS RESEARCH: G  
INTERDISCIPLINARY

Volume 21 Issue 3 Version 1.0 Year 2021

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4588 & Print ISSN: 0975-5853

# Policy Transfer: An Analysis of the Implementation of E-Government Reform Strategies by the Nigeria Immigration Service

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**Abstract-** Policy transfer has been the dominant approach by donors to domestic policy development in less developed countries across Africa. Arguably, countries in the global north have been the main sources and triggers of public sector reforms to Africa. Many of the reforms, were inspired by the ideas of New Public Management (NPM) and e-government strategies. The nature of the transfer has been partly imposed due to loan, debt relief, and technological dependence on the global north by the Nigerian Government. The donors that trigger such transfers in many cases ignored the domestic contextual factors and the critical role of Street-Level-Bureaucrates in policy implementation in developing countries. But the use of conditions by donors to impose policy on African governments may not necessarily lead to the expected outcomes of policy implementation. The Nigeria Immigration Service was used as an empirical case in this research. The data for this study was collected through the use of in-depth interviews with relevant governmental and non-governmental policy actors and documentary sources.

**Keywords:** *e-government, policy, policy transfer.*

**GJMBR-G Classification:** *JEL Code: H19*



POLICYTRANSFERANALYSISOF THEIMPLEMENTATION OF EGOVERNMENTREFORMSTRATEGIESBY THE NIGERIAIMMIGRATIONSERVICE

*Strictly as per the compliance and regulations of:*



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**Keywords:** e-government, policy, policy transfer.

## I. INTRODUCTION

Policy making is no longer an exclusive right of the national governments in less developed countries. Policy ideas and public sector reform strategies are in many cases sourced outside the continent. The reforms are inspired by the ideas of new public management and e-government strategies. New Public Management (NPM) and e-government strategies originated mainly from the European countries and the USA in the global north. Evidence from this study reveals that the domestic policy actors recognised the challenges of service delivery in the 21st Century and identified the need for global solutions to the problems with no evidence that such global solutions can address domestic peculiar challenges in Nigeria. The financial aid, loan and technological dependence of Nigeria on the global north made international donor organisations to be the major triggers of such policy transfers. Consequently, the transfer of internationally formulated

solutions to Nigeria has been mainly conditional rather than voluntary adoption of new innovations by Nigerian policy actors.

In most cases, the transfers were based on the number of policy assumptions. These include: that Nigerian government would effectively implement such reforms for fear of losing the much needed financial aids, loans, and technical assistance that come as a condition for reform acceptance. This is in line with the argument that a "... political leader in a Third World country has little alternative but to accept the policies imposed by the World Bank or the IMF given that the consequences of refusal are deepening debt and economic and, probably, political crisis" (Dolowitz and Marsh, 1996:245). This makes donors the major triggers and agents of policy transfer and public sector reforms from the international arena to Nigeria, a less developed country in Africa. But as this study demonstrates, the use of conditions to enforce policy transfer from the international arena to Nigeria may not necessarily lead to the expected outcomes of the implementation of the adopted reform strategies. This is so because the domestic factors and local policy actors not international donors implement public sector reforms in Nigeria.

The second assumption is that local contextual factors are suitable for the implementation of the internationally formulated policy solutions in Nigeria. This assumption makes international policy actors to overlook the domestic contextual factors, and coerce the political office holders to adopt reforms without considering local factors like culture, availability of infrastructure, and other critical domestic policy actors like the willingness of the ordinary citizens to accept new reforms before the adoption. This paper argues that the effective roll-out of public sector reform strategies from the international arena is not an automatic process even when conditions were attached to such transfers. This is the case because country's specific infrastructures, political commitment, and the citizens' acceptance of new reforms are necessary conditions for the effective roll-out of reform strategies in Nigeria.

The questions that guided the study are:

- i. From where did e-government reform strategies originate to the Nigeria Immigration Service?

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- ii. What were the causes and the modalities used for the transfer?
- iii. What factors constrained the effective implementation of the e-government reform strategies in the Nigeria Immigration Service?

The paper uses the case of e-government reform strategies in Nigeria Immigration Service and examined the dynamics of the effective implementation of policy transfer in Nigeria. It explores the origin, the actors involved and the factors that shaped and determined the effective roll-out of public sector reforms in Nigeria.

## II. THEORETICAL AND CONCEPTUAL FRAMEWORK

### a) *Policy Transfer*

In the original literature of policy transfer, Dolowitz and Marsh defined policy transfer as "...a process in which knowledge about policies, administrative arrangements, institutions etc. in one time and /or place is used in the development of policies, administrative arrangements and institutions in another time and/or place" (1996:344). Arguably, in less developed countries across Africa, the sources of solutions to the problems of service delivery have been not only across their national boundaries but also outside their continent. Countries in the global north have been the major sources of transfer of public sector reform strategies to improve service delivery in Africa. The extant literature has acknowledged that between 1980s and 2000, governments and donors in developed countries placed high priorities on policy transfer to domestic policy making especially in Africa (Azeez, Abidoye, Adesina, Agbele, & Oyewole, 2012; Heeks, 2002a; Karyeija, 2012). The reforms were inspired by the ideas of NPM and the use of e-government strategies to change the change structure of governments work and the delivery of public services in the continent. The reforms include privatisation of public enterprises, deregulation, downsizing, devaluation of local currencies among other examples. The major targets of those reforms are to improve efficiency in governance, and economy and effectiveness in the delivery of public goods and services across Africa. E-government is considered by international donors and domestic political policy actors as a key tool to deliver on the targets of increase efficiency, economy, accountability and transparency across Africa.

However, the transfers of those reform ideas from the donor countries mostly in the global north to less developed countries across Africa are in most cases not voluntary, they are conditional and sometimes coercive. Even though the extant literature suggests that public sector reforms across Africa were mostly motivated by the local demand for change and the desire by local governments to emulate international

reforms; this study argues that donors in most cases take advantage of African economic and political crises, use financial aids and loan conditionality to transfer internationally formulated solutions to many African countries. The use of conditionality and coercive measures like military might have long become the major determinants of policy transfer and public sector reforms across Africa (McCourt, 2001; Mkandawire & Soludo, 1999; Therkildsen & Development, 2001). But there are limits to how far the transfer of Western ideas can be effectively implemented in Africa even when conditions are attached to enforce policy transfer and public sector reforms. This is mostly due to the variations in the availability of basic infrastructures, citizens' willingness to accept new reforms and the commitments by local policy actors to implement reforms that originated from the global north. Thus, despite the transfer of NPM reform ideas to some countries across Africa, many of those reforms still remain interesting propositions that are not mostly implemented, or at best poorly executed especially in Nigeria (Antwi, Analoui, & Nana-Agyekum, 2008; Tambulasi, 2011). Many of the e-government reform strategies have failed to deliver on the original targets of their transfer from the international arena to Nigeria.

This study uses the multilevel frameworks of policy transfer as a core analytical element to understand the dynamics of the transfer and the implementation of e-government strategies from the international to Nigeria. The framework draws on Evans and Davies (1999) and Dolowitz and Marsh (2000) multilevel approach to policy transfer. The framework identified national and international policy actors and the role they play in domestic policy development through policy transfer in Nigeria. By way of definition, the multilevel framework of policy transfer is a term used to describe how the domestic policy-makers and the international interest groups find themselves negotiating policy agenda that leads to policy transfer across national boundaries (Evans, 2004; Hague, Harrop, & McCormick, 2016). Here, the authority and policy-making influence are shared across different levels of government: subnational, national, and supranational (Gualini, 2004; Hague et al., 2016).

But instead of using the international level, the macro-level and the inter-organizational level as Evans and Davies did, this paper uses the subnational, national, and international levels of government as Gualini (2004) used in his study with some modifications. This study argues that the international policy arena and actors and the national policy actors and factors are important in the effective implementation of public sector reforms in across developing countries where Nigeria is situated. By using this approach, the researcher hopes to not only identify specific countries in the international arena where e-government strategies

were transferred to Nigeria but also the pressures for the transfer, and the critical factors that determined the outcomes of effective implementation the reforms.

The paper treats policy transfer and the outcomes of the transfer as dependant variables. The transfer depends on certain pressures for reforms, and the effective roll-out of the reforms depends on the local contextual factors and the actions of the domestic policy actors in Nigeria that influence the outcomes of reforms implementation. This is the case because if one attempts to use policy transfer to explain effective policy outcomes, then one also needs to explain the reasons for transfer (Dolowitz & Marsh, 1996). Although the transfer of e-government reform strategies to Nigeria was successful, the outcomes of the transfer in terms of online service delivery, increase efficiency, transparency and the general reduction in the cost of governance have not been as successful as expected in the country. To explain the reasons for the poor implementation of the adopted reform programmes in Nigeria, it would be better to trace the origin of the transfer, the actors involved, the causes of the transfer and the critical factors and actors that determine the effective outcomes of the transfer in country. This is meaningful given the position of Nigeria in both global and African e-government ranking by the United Nations between 2001 and 2020.

#### b) *E-government*

There are various approaches to understanding the meaning of e-government, where there is convergence within the literature. E-government means the use of the Internet, website, computers, and any interconnected system that is used in the automatic acquisition, storage, sharing of data and delivery of information and services (United Nations, 2018). These technologies are powerful and fast, and have the potential to make sizeable savings in data and reduce both human and material cost of governance across national boundaries (King & Crewe, 2013). Even though many policy actors in the global south see e-government reforms as the installations of table computers and laptops in public offices, it is evident that e-government is more than mere putting of computers into government offices. It is the use of new technologies driven by the Information and Communication Technologies (ICT) innovations to transform the delivery of information and services, minimise physical contact in service delivery, and reduction in human and material costs of governance especially in Less Developed C (LDC).

Although e-government involves many applications and incorporates virtually all ICT platforms, the Internet is the major driver of the use of e-government reform strategies in both the global north and the global south. The internet has changed the way citizens and business organisations interact with their

governments across national boundaries especially in the global north. Just like the personal computer, the Internet has become an indispensable tool in governance in general and provision of online information and service delivery in particular. Governments across Africa as their counterparts in other parts of the World have created websites to provide information about their policies, programmes, goods and services online. It is expected that the adoption of e-government reforms by governments would also facilitate easy, cheap, fast and a more convenient way of interaction between government and the citizens, government and businesses, government and government and between government and their other clients online (Homburg, 2008; Mundy & Musa, 2010; Nyundo, 2013).

To successfully implement e-government reforms, the career public servants and the ordinary citizens who are critical stakeholders in reform implementation must be willing to accept new reforms. Basic infrastructures like stable electricity supply, personal security and safety, personal computers and laptops must be available and affordable to all who would like to own them. But it appears that these critical issues in most cases have not been considered prior to the transfer of e-government reform strategies from the international arena to Nigeria as in many other African countries. This partly explains the reasons why in the global south where Nigeria is situated, the implementation of e-government strategies has not been as successful as hoped for especially by the international donors that used conditionality to coerce governments in the global south to reform. For instance, countries like Somalia, Chad, South Sudan, and Democratic Republic of Congo were ranked at the bottom of global e-government ranking by the UN. These are countries with extreme poverty, poor electricity supply and Internet connectivity, and are politically and economically unstable countries. These conditions have the potentials to affect the successful roll-out of e-government reforms in the aforementioned countries. Apart from five countries namely: Mauritius ranked 1<sup>st</sup> in Africa and 58<sup>th</sup> globally, and Tunisia ranked second in Africa and 72<sup>nd</sup> globally. Others are South Africa 3<sup>rd</sup> in Africa but 76<sup>th</sup> in the world, Morocco 4<sup>th</sup> in Africa and 85<sup>th</sup> in the world, and Seychelles 5<sup>th</sup> in Africa and 86<sup>th</sup> in the world. All other Africa countries including Nigeria were placed in the lower two tiers of e-government capacity: medium and minimal e-government capacities (UN e-government Survey, 2018). The position of Africa in global e-government ranking can be attributed to the limited technological infrastructure, poverty, and inadequate human capacity, political instability, local currency devaluation, and poor personal security and safety.

The UN e-government survey report ranked Nigeria fifth in Africa behind South Africa, Djibouti,

Gabon, and Cote d'Ivoire. The country was placed among the countries with a minimal e-government capacity in the World. Thirteen years later, in 2014 to be precise; the United Nations e-government survey 2014 placed Nigeria in the middle of the top 20 countries in Africa and 141 in the world respectively (United Nations e-government survey report, 2014). This means that Nigeria is ranked behind countries like Egypt, Morocco, Mauritius, and South Africa. The position of Nigeria in the global and Africa e-government ranking by the UN has deteriorated considerably over the years. Nigeria is not among the top 20 countries in e-government ranking in Africa according to the 2016 United Nations e-government survey reports (United Nations e-government Survey Report, 2016). The country is again ranked behind countries like Egypt, Morocco, Kenya, Mauritius, South Africa, and Kenya. This is certainly not the best position for Nigeria. Given that the country earns huge amount of revenue from the sales of crude oil, and is the biggest economy in Africa. The claims by government that e-government reforms have been successfully implemented has been contested by the empirical evidence from this study and the factors responsible for the not successful outcomes of e-government reform strategies have been identified and discussed.

### III. RESEARCH DESIGN AND METHODS

A case study research design was used for this study. The theoretical assumptions about policy transfer and their influence on the paper's research questions justified the choice of a case study research design. A case study research design enables the researcher "...to gain insight into the world of several groups of stakeholders...discover the world as seen by participants in the system, and try to explain why they see it this way" (Swanborn, 2010:23). The strength of case study research design lies in its ability to deal with a variety of evidences such as documents, and interviews from multiple sources. This design also "...benefits from the prior development of theoretical propositions to guide data collection and analysis" (Yin, 2013:17). It is an in-depth investigation from multiple sources and perspectives of research participants that provides in-depth understanding of a specific phenomenon under investigations.

Two different qualitative methods of data collection were used to generate the necessary data for this paper. The use of different qualitative methods of data collection is also for triangulation purposes. Triangulation is important to ensure reliability, and validity of the data due to subjectivity and limitations that may be associated with the use of only one tool of data collection (Tambulasi, 2011; Yin, 2009). The qualitative methods of data collection used in this study were interviews with different categories of the research

subjects, and the documentary sources. The documentary sources include government and the United Nations publications on e-government reforms in Nigeria. The primary data were generated with the use of in-depth interviews with 3 officials of Nigeria Immigration Service (NIS), 2 officials of World Bank, 3 academics, 2 representatives of Peoples Democratic Party (PDP), 1 official of All Progressive Congress (APC) and 2 policy experts respectively.

#### a) *The Empirical Case Study: Nigeria Immigration Service*

The Nigeria Immigration Service (NIS) was established as an agency of government responsible for immigration matters in 1958 prior to political independence in 1960. The agency is one of the para-military agencies under the Federal Ministry of Internal Affairs. Its mandates is the control of the people coming into or leaving the country. The agency issues passport to Nigerians in and outside the country and residence permits to foreigners in Nigeria (Nigeria Immigration Service, 2017:2). Prior to the introduction of the e-government reforms at the NIS, the Nigeria passport was a handwritten document. Service delivery then requires physical contacts between the officials of the Nigeria Immigration Service and the service consumers. All payments were made on the Counter and in some designated banks across the country (Olatokun & Abduldayan, 2014).

A number of problems associated with this manual service delivery were identified by the research participants. These include multiple issuances of passport, weak security features the passport, and identity theft. Others included the delay in service delivery, difficulties in accessing immigration related information, diversion of government revenue, ghost workers and lack of efficiency and accountability in service delivery. There are participants who suggested that a desire to solve these problems in line with the global best practices led to the transfer of different e-government initiatives to the NIS. Others emphasised that the pressure from the international community was more responsible for policy transfer to Nigeria. In this regard, the paper identifies two broader causes of the transfer of e-government reforms to the NIS. The domestic demand for change and the external pressure for the transfer of e-government reform strategies to Nigeria. Consequently, the e-government reforms implemented at the NIS include: the Machine Readable Passport, Electronic Passport, the creation of the official websites to have online presence and the use of the Internet to deliver information and services to the target audience.

## IV. FINDINGS

Table 1: Summary of Key Findings

E-government Strategies	Machine Readable Passport (MRP)	E-passport	The internet and dedicated website
Places of Origin to Nigeria	UK	UK, Australia, New Zealand, Germany, France and the USA	UK, Canada, USA and South Korea, China, India, Bangladesh and South Africa
Actors involved in the transfer	International Civil Aviation Organisation (ICAO) and officials of the Nigeria Immigration Service	ICAO, World Bank, EU, UKDFID, officials of NITDA, Federal Ministry of Communication and Nigeria Immigration Service	World Bank, EU, Korea Institute for Development Strategy, UKDFID, NITDA, Federal Ministry of Communication, Nigeria Immigration Service
Causes of the transfer	To replace non- MRP, stop identity theft, multiple acquisitions, improve national security, and pressure from the ICAO	To improve national security, prevent identity theft, multiple issuance; international prestige and leadership, pressure from the ICAO, and the need to implement Peoples Democratic Party (PDP) manifesto	The desire to improve efficiency and transparency, to bring public service and information closer to the people, and eliminate corrupt practices
Modalities for the transfer	Conferences and international pressure	Conferences, capacity building, case study visits, conditions for board	Conferences, capacity building programmes, formal education training in ICT

Source: field work 2017

## V. DISCUSSION OF FINDINGS

### a) The Origin of E-government Reform in Nigeria Immigration Service (NIS)

This section presents a discussion of findings from the empirical case study on the origin of e-government reform strategies implemented in (NIS). The aim is to answer the study's first research question that is from where did e-government reform strategies originate to Nigeria?

Through the study of one empirical case, this paper reveals that the e-government reform strategies implemented in Nigeria originated from countries in both global north and the global South. These countries include the UK, USA, Canada, France, New Zealand, Germany, China, India, Bangladesh and Pakistan. This is not surprising given that many of the so-called solutions originated outside African continent. These include liberal democracy, New Public Management reforms and the latest being the e-government strategies adopted across different Ministries and agencies of government. This is in line with the policy transfer framework developed by Dolowitz and Marsh that international arena is the common source of policy transfer among nation states (Dolowitz & Marsh, 2000; Evans, 2004). Governments can transfer from either the

national or the subnational levels. This is also in line with the theoretical framework developed for this study where it is argued that the international arena is the source of e-government reforms implemented in Nigeria. The finding is also supported by the argument in the extant literature that e-government initiatives have already arrived in Africa as imported reform concepts based on imported design (Benson, 2018 & Heeks, 2002:97).

Prior to the transfer of e-government strategies to Nigeria, domestic policy actors "travelled to the UK, Canada, India, China and the US before writing the first draft of National Policy on e-government reforms" (Policy expert 01). The e-government strategies include the Machine Readable Passport (MRP), e-passport, e-payment, the Internet, and the establishment of official websites. They were transferred mainly from Western Countries in the global north and some countries like China, India, Pakistan in the global South to Nigeria.

### b) The Actors Involved in the Transfer

The majority of the participants in this study have identified domestic policy actors and the international donors as the agents of the transfer of e-government strategies from the global north to the NIS. The domestic actors involved in the transfer are the senior civil servants of the Nigeria Immigration Service

(NIS), politicians and policy experts. However, international donors were considered by the research participants' to be the major policy actors that initiated the transfer of e-government reforms to Nigeria. The findings of this study revealed that the donors involved in the transfer are the International Civil Aviation Organisation (ICAO), the European Union and the World Bank. This finding agrees with the original literature of policy transfer by Dolowitz and Marsh where they identified international organisations and donor agencies as agents of policy transfer (Dolowitz & Marsh, 1996; Dolowitz & Marsh, 2000).

The extant literature acknowledges that donor organisations and financial institutions have been in many cases responsible for the transfer of New Public Management reform strategies from the global north to the global south (Heeks, 2002b; Tambulasi, 2011; Tettey, 2001; Therkildsen & Development, 2001). Although the study reveals that both domestic and international policy actors were involved in the transfer of e-government reform strategies to Nigeria, majority of the research participants claimed that donors were more responsible for the transfer than the domestic policy actors because of the modalities used for the transfer.

#### c) *The Modalities Used for the Transfer*

There were different opinions on the modalities used by both domestic policy actors and the international donors for the transfer of e-government strategies to the NIS. However, a common view amongst those opinions was identified. The majority of the participants remarked that conference, workshops were used as modalities by policy actors to transfer e-government initiatives to Nigeria. Others are the financial support by donors to Nigeria, case study visits by local policy actors to countries that have implemented those reforms, and the condition for acceptance into ICAO board membership. These conditions were used by donors to transfer e-government reform strategies to NIS. Donors offer technical assistance to the NIS in different fields. These include providing consultants who advised the NIS in diverse areas including e-government reforms, and sharing experience of other developed countries with the staff of the NIS.

Donors like the ICAO and the Korean Institute for Development Strategy gave financial support to government officials to attend training, workshops and conferences within and outside the country on E-passport reform and the establishment of the online present. When government officials attend such conferences and formal academic training especially in the area of ICT, they usually write report on their return. They make some policy recommendations to the government to implement in line with what they have learnt, and of course based on donors policy prescriptions.

Due to Nigeria's dependence on the global north for financial aid, loans, and technology transfer, conditions were used to enforce the transfer of the MRP, e-passport, and the internet reforms introduced in the NIS. One such condition by the ICAO was that Nigeria must adopt the use of E-passport as a condition for admittance into its Board. The country accepted, introduced e-passport reform and became the only African country in the Board of ICAO in 2009. This is in line with Dolowitz and Marsh framework of conditional policy transfer (see Dolowitz & Marsh, 1996; Evans, 2004). Even though, government officials described it as a voluntary policy transfer, evidence above suggests that it was a clear case of conditional rather than voluntary policy transfer. Supra-national institutions like the World Bank, IMF and EU have played a crucial role in the spread of Western monetary policies to Third World countries. Although, the IMF or World Bank loans may appear cheaper for developing countries, in return these donors stipulate certain reform initiatives that have to be implemented if the loan is to be granted to those countries in need (Dolowitz and Marsh, 1996:348).

The donors also used experience sharing as a mechanism for the transfer. They mostly did that by discussing the benefits of such reforms and their achievements in many countries in the global north with the local policy actors in the developing country. This modality was effectively used in the transfer of e-passport, the internet and website reforms in Nigeria. The donors recommended and made some financial contributions for government officials to visit mostly developed countries to learn from their experience and to transfer the reform ideas to Nigeria. This was possible because political leaders in many countries in the global south have little but to accept the public sector ideas suggested by the World Bank or IMF given that the result of non-acceptance are likely deepening economic and political crisis (see Dolowitz and Marsh 1996). This study reveals that e-government reforms were used by the ICAO, the World Bank, and the EU as a condition for technical and financial support for Nigerian government. This finding supports the argument that when aid agencies are making loans, organising conferences and sharing experiences, they are likely to lead to conditional policy transfer especially in the third world countries (Dolowitz & Marsh, 2000; Evans, 2004).

#### d) *The Causes of the Transfer*

Although Nation States strive for more efficient and better ways of delivery public services, findings from this study revealed that international pressure has been the major driver for the adoption of e-passport reform at the Nigeria Immigration Service. These international pressures are discussed below.

i. *The International Pressure for Transfer*

Pressure from the international community often leads to policy transfer and public sector reforms especially from the global north to Africa. The international arena is a field that serves as a source of policy transfer and home that accommodate donors that influence policy transfer across Africa. The participants in this study believe that the actual pressure that led to the transfer of e-government strategies to NIS came from the international community. They argued that the use of conditions for financial assistance by the World Bank, the European Union, and for admission into the board of the ICAO were the major causes for the transfer of e-government reforms to the NIS. This is the case because:

The more donor dependant a nation is, the less likely it is to set its own agenda behind which donor efforts can be aligned. That is why in most cases, donors dictate the agenda for reforms. Poverty has robbed our policy actors of their self-confidence, and self-esteem. It has made them to allow donors to dictate policy prescriptions to them even when those donors lack the sufficient knowledge of the local environment (Policy Expert 02, 2017).

A similar argument was made by another participant that:

It is a global best practice that is also in line with the International Civil Aviation Organisation standards of operations. It was a condition for admittance into the Board of ICAO. That is why in due recognition of Nigeria Immigration Services stride the ICAO, the global body that regulates standards for travel documents admitted Nigeria into its Board as the sole African representative in 2009 (Government official 04).

The international donor organisations took advantage of the hierarchical international aid regimes to transfer e-government strategies to Nigeria. Studies have revealed that subtle coercive pressure and the use of conditions by donors led to policy transfer especially from the global north to the global south (Dolowitz & Marsh, 1996; Evans, 2004; McCourt et al., 2001). Many of the interviewees considered donors as the major triggers of public sector reforms in Nigeria despite acknowledging the involvement of local policy actors in the process of the transfer. This is in line with the argument in the extant literature that conditional transfer occurs when the international policy arena contains agents powerful enough to impose best practices on nation states (Dolowitz & Marsh, 1996; Evans, 2004).

Another important issue that emerged from the interviews was the argument by the participants that donors also get good returns on their policy proposals and reform strategies when they transfer them to Nigeria. They noted that that has been the motivation on the part of the donor agencies to continue to introduce

new reform strategies to the Nigeria government, and use conditions to enforce acceptance in the country.

e) *The Constraints for the Effective Roll-out of E-government Strategies in Nigeria*

Many of the participants argued that the government's e-government strategies implemented at the Nigeria Immigration Service have not been as successful as they should have been. The majority of the respondents attributed the failure of e-government reforms at the Nigeria Immigration service to a number of factors. These include the high cost of e-government strategies and their implications on national security. Others are the poor electricity supply and Internet connectivity, low level of ICT skill and high rate of poverty, and corruption in governance. The majority of the interviewees across all the five categories of the research participants identified the aforementioned factors as the major constraint to the effective roll-out of e-government reform strategies at the NIS.

i. *Poor electricity supply and internet connectivity*

A stable electricity supply and access to Internet connectivity are important ingredients for the successful roll-out of e-government reform strategies. Electricity and the Internet connectivity are required to access information and services online. Where these two basic infrastructures are not available or are available only to the few because of the cost involved and the high level of poverty among the supposed e-service consumers, e-government reforms would not be as successful as they should have been. The majority of the interviewees attributed the not very successful implementation of e-government reforms at the NIS to these twin problems of electricity supply and the high cost of Internet connectivity. They observed that many of the NIS offices across the nation depend on generators for power supply and the financial implications of doing so high. The cost of Internet subscription is also high. These challenges are affecting the online service and information delivery at the NIS. One concern expressed regarding power supply and internet connectivity was that:

Epileptic power supply is disrupting the success of e-government here in the Nigeria Immigration Service. Irregular power supply is common in Nigeria with negative impacts on our ICT facilities. The service depends on the generating sets as an alternative source of power supply to our ICT facilities. In addition, the cost of internet subscription is also very high without government subsidy. The financial implications of paying for internet subscription without subsidy and depending on generators as alternative source of power supply have added to the costs of service delivery in Nigeria (Government official 01, 2021).



Many of the respondents noted that poor power supply and the high cost of internet connection has been a challenge to the effective implementation of e-government strategies of the NIS. The interviewees noted that irregular power supply and the cost of internet subscription is affecting both the service providers and the service consumers in Nigeria. This is the case because not every Nigerian has access to electricity and many cannot afford to use generators as an alternative source of power supply. The overwhelming majority of Nigerians do not also have access to the internet. Hence, even when information and services are available online, many people go for the traditional method that requires physical contacts between service provider and service consumers. The participants on the whole demonstrated that the combined impacts of lack of sufficient electricity supply and access to the internet constitute a barrier to the success of e-government reforms at the NIS.

i. *Low ICT Skill, high rate of poverty and poor funding of e-government initiatives*

The Information and Communication Technology (ICT) education and skills have been identified by the majority of the interviewees in this study as the basic requirement for the success of e-government in Nigeria. But the interviewees remarked that this basic infrastructure at best is grossly insufficient and in some places and among some categories of individuals is completely lacking. The participants argued that this is one of the reasons why e-government reforms have not been successful in the Nigeria Immigration Service. The respondents attributed the low ICT skills among both the government employees and the general public to poverty. They observed that the poverty rate has prevented many people who are willing from having ICT training and workshops within and outside the country. They claimed that not all government employees at the NIS have ICT training and education because the service cannot afford to pay the training fees for its entire staff to go for the basic ICT training and workshops. Many of the interviewees claimed that the government budgetary allocation to the Nigeria Immigration Service has always been low, and cannot meet all the financial requirements of e-government projects. In this regard, a respondent argued that:

The majority of the employees at the Nigeria Immigration Service do not have the required level of education and training in ICT to successfully perform the task of e-service delivery. The few with the ICT knowledge are not willing to give on the job training to those without the skills. And the organisation does not have enough money to send every employee for ICT training either within or outside the country because of the size of its budget. The few employees with ICT skills are being

overwhelmed with huge tasks. This has been our predicament at the Nigeria Immigration Service (Government official 01, 2021).

This view was echoed by one of the policy experts interviewed when he said that 'a low ICT skill among government employees and the target beneficiaries of their e-services has been a threat to the success of e-government reforms in Nigeria. The low ICT education could be linked to the high rate of poverty in the country'. The study reveals that there are employees who are willing to go for ICT trainings to acquire the basic skills to meet the new requirements of their official responsibility but cannot do so because of the fees involved and their financial status. There are individuals outside government without ICT education. This category of individuals cannot benefit from e-services and e-information even when such services are available for them online.

## VI. CONCLUSION

This paper used a single empirical case study to explore the dynamics of the transfer of e-government reform strategies from the international arena to the Nigeria Immigration Service. The study answered questions related to the origin, the exogenous causes of the transfer, the actors involved and the modalities used for the transfer. The paper used a case study research design and qualitative methods of data collections to generate relevant data from different research participants to answer the study's research questions.

The findings have significant implications for policy development in Nigeria and other developing countries across Africa. As has been demonstrated by the study, we can say that while nation states strive for increase efficiency and productivity, international pressure is the major cause of policy transfer from the international arena to Nigeria. This is due to the Nigeria dependence on the global north for financial assistance, and technology transfer. But local conditions are the determinants of the outcomes of the transfer of e-government reforms not the donors that enforced the transfer. Local factors and actors should be considered before the transfer of western solutions to less developed countries across Africa. The availability of basic infrastructures, economic and educational conditions etc. of the people must not be ignored in the transfer of solutions of western origin to less developed countries in Africa. In addition, citizens' acceptance of reforms is important for the success of policy transfer across Africa. This is the case because citizens are the potential consumers and the major beneficiaries of policy transfer and public sector reforms across Africa. Thus, they should not be ignored in the process of the transfer because they are among the important domestic policy actors that determine the outcomes of policy transfer. Without their support in patronising the e-

services and e-information, even if such services are available, e-government reforms would not be as successful as they should have been in Nigeria. Consequently, while donors in most cases are responsible for policy transfer and public sector reforms in LDCs, national factors and actors are the main determinant of the effective roll-out of policy transfer.

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GLOBAL JOURNAL OF MANAGEMENT AND BUSINESS RESEARCH: G  
INTERDISCIPLINARY

Volume 21 Issue 3 Version 1.0 Year 2021

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4588 & Print ISSN: 0975-5853

# Ecodesign and Eco-Innovation, Through Factor Analysis with the Main Component Extraction Method

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**Abstract-** The present work begins with the development of the concept of what is the factorial analysis mentioning and defining the concept, as well as some uses such as the reduction of dimensions, by the use of many and different variables, which may affect a subject to study.

The next part is devoted to the use of the multivariate statistical technique with an independent approach in eco-innovation studies, that is, factor analysis and ecoinnovation. This section mentions the fact that in studies related to eco-innovation the works that have been carried out are of the qualitative type and the quantitative ones are very scarce or almost null, in relation to the use of factorial analysis.

**Keywords:** *eco-innovation, environmental impact, factor analysis, main components.*

**GJMBR-G Classification:** *JEL Code: Q00*



*Strictly as per the compliance and regulations of:*



# Ecodesign and Eco-Innovation, Through Factor Analysis with the Main Component Extraction Method

## Ecodiseño Y Eco-Innovación, a Través Del Análisis Factorial Con Método De Extracción Por Componentes Principales

Luis Alberto Arroyo Gonzalez

**Resumen-** El presente trabajo comienza con el desarrollo del concepto de lo que es el análisis factorial mencionando y definiendo el concepto, además de algunos usos como el de la reducción de dimensiones, por el uso de muchas y diferentes variables, que pueden afectar un tema a estudiar.

La siguiente parte se dedica a el uso de la técnica estadística multivariante de enfoque independiente en los estudios de eco-innovación, es decir el análisis factorial y la ecoinnovación. En esta sección se menciona el hecho de que en estudios relacionados con la eco-innovación los trabajos que se han realizado son del tipo cualitativo y los cuantitativos son muy escasos o casi nulos, en relación al uso del análisis factorial.

Se continua con la exposición del trabajo intitulado "Hacia una mejor comprensión de la eco-innovación como motor de la competitividad sostenible". En este trabajo el Análisis factorial basado en la solución de Componentes Principales se utilizó para saber si alguna de las características y aspectos tienen un comportamiento parecido. Se muestran las variables utilizadas y el cuestionario utilizado en las encuestas realizadas para saber cuales son las variables que más se correlacionan entre ellas.

En la parte de la discusión se muestra la agrupación de los factores de acuerdo a los resultados del trabajo de investigación.

El desarrollo 2 corresponde al trabajo denominado, "Eco-innovación en empresas hoteleras de Oaxaca, México". El trabajo de las académicas busca proponer un instrumento de medición de la variable eco-innovación en el ramo hotelero, pero también busca profundizar en las consecuencias ambientales que la eco-innovación propicia a través de la relación entre el desempeño ambiental y la eco-innovación por unidades de hospedaje, con la finalidad de generar conocimiento en los estudios cuantitativos de temas ambientales con la técnica de análisis factorial por componentes principales. Se presenta la hipótesis a comprobar y un constructo con las variables y las dimensiones.

Por último en la discusión 2.1 se presentan las dimensiones para cada una de las variables y su relación entre ellas así como los resultados obtenidos por la varianza total explicada y el resultado del alfa de cronbach.

Se termina con la conclusión del trabajo argumentando la importancia de aplicar este tipo de análisis

cuantitativo en los trabajos de eco-innovación con la finalidad y objetivo de alcanzar las metas del desarrollo sostenible.

**Palabras clave:** eco-innovación, impacto ambiental, análisis factorial, componentes principales.

**Abstract-** The present work begins with the development of the concept of what is the factorial analysis mentioning and defining the concept, as well as some uses such as the reduction of dimensions, by the use of many and different variables, which may affect a subject to study.

The next part is devoted to the use of the multivariate statistical technique with an independent approach in eco-innovation studies, that is, factor analysis and ecoinnovation. This section mentions the fact that in studies related to eco-innovation the works that have been carried out are of the qualitative type and the quantitative ones are very scarce or almost null, in relation to the use of factorial analysis.

The work entitled "Towards a better understanding of eco-innovation as an engine of sustainable competitiveness" continues. In this work, Factor Analysis based on the Principal Components solution was used to know if any of the characteristics and aspects have a similar behavior. The variables used and the questionnaire used in the surveys carried out are shown to know which are the most correlated variables between them.

In the part of the discussion the grouping of the factors according to the results of the research work is shown. Development 2 corresponds to the work called, "Eco-innovation in hotel companies of Oaxaca, Mexico". The work of the academics seeks to propose an instrument for measuring the variable eco-innovation in the hotel industry, but also seeks to deepen the environmental consequences that eco-innovation promotes through the relationship between environmental performance and eco-innovation by accommodation units, with the purpose of generating knowledge in quantitative studies of environmental issues with the technique of factorial analysis by main components. The hypothesis to be tested and a construct with the variables and dimensions are presented.

Finally, in the discussion 2.1 the dimensions for each of the variables and their relation between them are presented as well as the results obtained by the total variance explained and the result of the cronbach's alpha.

We conclude with the conclusion of the work arguing the importance of applying this type of quantitative analysis in the eco-innovation works with the purpose and objective of achieving the goals of sustainable development.

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**Keywords:** *eco-innovation, environmental impact, factor analysis, main components.*

## INTRODUCCIÓN

Los trabajos expuestos en este capítulo son valiosos debido al hecho de que estudios empíricos cuantitativos en los que se haya utilizado la técnica multivariante de enfoque independiente conocida como, Análisis Factorial por el Método de Componentes Principales, son muy escasos en la medición, análisis e impacto de la eco-innovación.

Ante un panorama de escasez recursos naturales, crecimiento poblacional, incremento de la demanda de bienes y servicios, se vuelve imprescindible adoptar nuevas culturas organizacionales e interdisciplinarias que permitan la adopción de estrategias sustentables que aseguren el buen vivir de las generaciones venideras, en un ambiente de competitividad empresarial.

Los nuevos emprendedores y los ya existentes deberán forzosamente adoptar las nuevas estrategias que se están gestando a nivel global, con la finalidad de mantenerse y en su caso incrementar sus ventajas competitivas.

Los trabajos presentados le servirán al lector para conocer la aplicación de la técnica mencionada y en su caso saber aplicarla en diferentes contextos y giros empresariales. Se tiene por delante un amplísimo campo de acción, en los que se puede aplicar lo aquí mostrado, con la idea de cambiar el paradigma de la economía lineal y empezar a emigrar a un modelo económico más amigable y sostenible con el medio ambiente, como el que se está gestando en la actualidad conocido como de economía circular.

La eco-innovación es uno de los factores habilitantes claves, para la adopción de proyectos en economía circular CONAMA (2018), y el método de análisis factorial por componentes principales nos ayuda a gestionar una mejor toma de decisiones, con miras al incremento de la competitividad.

### I. DESARROLLO

El análisis factorial es una técnica multivariante de enfoque interdependiente, la cual ha sido muy utilizada en trabajos de investigación, a partir de los últimos años del siglo XX, según Mejía en la medida que aumenta el número de variables en una investigación se vuelve indispensable profundizar en las estructuras del sujeto de investigación.

El análisis factorial es una técnica de interdependencia en la que se consideran todas las variables simultáneamente, cada una relacionada con todas las demás y empleando todavía el concepto del valor teórico, el compuesto lineal de las variables. En el análisis factorial, los valores teóricos (los factores) se forman para maximizar su

explicación de la serie de variables entera y, y no para predecir unas variables dependientes. (Mejía, 2018, p.3)

Otra definición es la propuesta por De la Fuente (2011) en la que establece que el Análisis Factorial es una técnica para hacer más pequeños la cantidad de datos y que se utiliza para definir grupos con características similares de variables, partiendo de un grupo grande de variables.

Los grupos con características similares se crean con las variables que se correlacionan demasiado entre ellas mismas y se pretende en un inicio que los grupos no guarden relación entre sí.

En los estudios en los que se generan muchas variables al mismo tiempo, como en el caso de la aplicación de cuestionarios en temas específicos, tal vez el investigador esté interesado en saber si las preguntas que se están aplicando guardan cierta relación.

Con la aplicación del Análisis factorial en las respuestas de los cuestionados probablemente existen grupos de variables, con significados similares y se pueden obtener de esta forma una disminución del número de dimensiones indispensables para darle sentido a las respuestas de los interrogados.

“El Análisis Factorial es, por tanto, una técnica de reducción de la dimensionalidad de los datos. Su propósito último consiste en buscar el número mínimo de dimensiones capaces de explicar el máximo de información contenida en los datos” (De la Fuente, 2011, p.1).

Lo que se busca con el Análisis factorial (Análisis de Componentes Principales, también llamado de factores comunes) es reducir la información que nos arroja una matriz de correlación con la intención de hacerla más entendible.

Básicamente al analizar la matriz de correlación lo que se pretende es responder al cuestionamiento acerca de ¿cuál es el motivo por el que unas variables se relacionan más entre ellas y menos con algunas otras?. Supuestamente esto se debe al hecho de que hay otras variables y dimensiones o factores que explican en mayor medida la relación de unas con otras variables.

#### *El análisis factorial en los trabajos de eco-innovación*

El análisis factorial como técnica estadística multivariante para medir específicamente los impactos de la eco-innovación, ha sido muy poco usado en trabajos científicos académicos.

Al respecto, Hermosilla, del Río González, Kiefer y Barroso (2016) aseguran que: “La mayor parte de la literatura revisada presenta análisis teóricos, y cuando se trata de estudios empíricos son en su mayor parte de carácter cualitativo. Los estudios cuantitativos son muy escasos, una carencia que intenta cubrir este artículo”(p.33).

El trabajo intitulado “Hacia una mejor comprensión de la eco-innovación como motor de la competitividad sostenible”, utiliza el análisis factorial basado en la solución de componentes principales.

Acerca de la metodología, datos y análisis, Herмосilla et al. (2016), menciona que con la idea de sumar al conocimiento existente en lo referente a la dimensión del diseño de la eco-innovación, se llevo a cabo un análisis exhaustivo acerca de la literatura existente al respecto de los conceptos relacionados con la eco-innovación como lo son; innovación ecológica, innovación sostenible, innovación ambiental e innovación verde, lo que se encontró fue que todos los conceptos anteriores pertenecen al mismo fenómeno (Hojnik y Ruzzier 2016; Schiederig, Tietze, y Herstatt 2012).

Los autores y sus colaboradores encontraron e identificaron 10 características o aspectos fundamentales de la dimensión del diseño de la eco-innovación. Por lo anterior, afirma: “Para un análisis cuantitativo se vuelve necesario convertir esas características y aspectos cualitativos identificados en la literatura en forma de variables cuantificables. Para cada variable se ha creado una pregunta específica dentro del cuestionario” (Herмосilla et al. 2016, p.33).

Con la idea de dar certeza de que las preguntas fueran claras y concisas, pero además pretendiendo que fueran de fácil entendimiento para los encuestados y con la finalidad de asegurar la validez del instrumento en su contenido, se realizó una encuesta piloto, aplicándola previamente a una docena de expertos académicos y profesionales, lo que sirvió para implementar y transformar el instrumento en su versión final.

El instrumento definitivo tomó en cuenta 10 cuestionamientos relacionados directamente a la dimensión del diseño de las eco-innovaciones, las percepciones de los encuestados fueron recabadas por medio de escalas de Likert, con 5 parámetros desde; 1 nada, 2 poco, 3 algo, 4 bastante y 5 mucho, y se agregó la opción de no responder.

En este trabajo el Análisis factorial basado en la solución de Componentes Principales se utilizó para saber si alguna de las características y aspectos tienen un comportamiento parecido.

En este caso, sería posible reducir el conjunto de variables a un número más pequeño de factores que permitan revelar la estructura subyacente de la dimensión del diseño de la eco-innovación y así identificar si apoyan nuestro marco conceptual cualitativo previo como lo expusimos en Carrillo-Hermosilla, Del Río y Könnölä (2010). (Herмосilla et al. 2016, p.33).

El siguiente recuadro muestra las preguntas relacionadas a la dimensión del diseño, en base a las variables identificadas previamente, cabe mencionar que los autores realizan una conceptualización de la eco-innovación con la finalidad de que al realizar la encuesta los encuestados tengan una idea clara de la definición del concepto, por lo que la definen así:

A efectos de este cuestionario, consideramos una eco-innovación como la introducción de nuevos productos (bienes o servicios) y/o procesos significativamente mejorados que reduzcan el uso de los recursos naturales (materiales, energía, agua y tierra) y/o que disminuyan la emisión de sustancias contaminantes. (Herмосilla et al. 2016, p.39).

¿Ha introducido su empresa una eco-innovación en la propia empresa o en el mercado en los últimos años?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en -Ahorro en el uso de materiales, energía agua y tierra?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en -Aumento de la posibilidad de reciclaje?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en -Aumento del ciclo de vida del producto o servicio?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en -Reducción de emisiones en aire, agua o reducción de residuos?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en -Aumento del uso de materiales renovables?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en -Abandono de recursos y materiales a cambio de recursos y materiales más sostenibles?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en - Ruptura con los procesos anteriores de elaboración de productos o entrega de servicios hacia soluciones más sostenibles?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en -Ruptura con los procesos anteriores de gestión de su empresa?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en -Redefinición del modelo de negocio de su empresa (total o parcialmente)?

¿Cuál ha sido el nivel de impacto de esa eco-innovación en - Reducción de la toxicidad del producto o servicio?

Fuente: (Hermosilla et al. 2016)

Los resultados del análisis factorial en este estudio sugirieron mantener 4 factores que en combinación explican un 74.1% de la varianza.

#### a) *Discusión*

En este apartado se presentarán la agrupación de los factores de acuerdo a los resultados del análisis factorial.

Las variables que se agrupan en el factor 1 representan el impacto de la ecoinnovación encima de la formación material del producto o servicio, pero también toma en cuenta el aumento del uso de recursos y materiales sostenibles, el impacto de la eco-innovación en el incremento de la factibilidad en el reciclaje y el alargamiento del periodo de vida útil del producto o servicio.

El factor 2, muestra el impacto de la eco-innovación en la gestión empresarial, tomando en cuenta el quiebre con la idea de la fabricación de productos y servicios que sean más sostenibles. Lo que se traduce entiende como un cambio en el modelo de negocio de forma más sostenible. El factor dos se relaciona con la eco-eficiencia, ya que hace énfasis en los cambios necesarios para alcanzar la disminución de los impactos ambientales.

El factor 3, se encarga de los ahorros directos que resultan de la adopción del proceso de eco-innovación, son producto de la disminución en el consumo de materiales, energía, agua y de la ocupación espacial. Estos ahorros se ven reflejados en beneficios económicos a través de la disminución de costos para la empresa que esto se vea reflejado en un incremento del precio para los consumidores.

El factor 4, es la representación de la reducción de las emisiones a causa de la implementación de las eco-innovaciones, ya sean el aire, agua y residuos o sustancias tóxicas. Este tipo de reducciones básicamente son tomadas en cuenta como filtros de final de tubería. Los residuos y las emisiones resultantes de los procesos de fabricación tanto de productos y servicios, no son considerados como inputs ya que no son factibles de reciclado y no son usados en procesos posteriores.

El factor 5, representa las variables relacionadas con la disminución de la toxicidad del producto o servicio, aunque se debe señalar que este factor está relacionado con los otros cuatro factores. Por tal motivo este factor se posiciona de forma transversal a todos los demás factores. Por la compatibilidad que se muestra entre el sistema económico y ecológico, la disminución de la toxicidad impactará en distintos niveles a la sostenibilidad ambiental.

## II. DESARROLLO

Otro de los escasos trabajos en los que se ha utilizado el Análisis Factorial con Componentes Principales el desarrollado por Reyes y Sánchez (2016) intitulado "Eco-Innovación en Empresas Hoteleras de Oaxaca, México".

En el mismo argumentan que el turismo es una de las actividades consideradas como motor de crecimiento económico a nivel mundial y sin duda es un factor clave de transición a una economía sustentable (OCDE, 2012). Cabe mencionar también que este rubro, el de las empresas hoteleras, es un claro ejemplo de la dicotomía entre la sostenibilidad y la competitividad.

Un factor importante que podría representar la transición de la empresa turística hacia una economía verde es la eco-innovación. Sin embargo, y aun cuando en la hotelería las empresas están haciendo contribuciones significativas al desarrollo sustentable por medio de innovaciones ambientales, sus aportaciones son pobremente valoradas e incluso no evidenciadas, Tarnawska, (2014) citado en (Reyes y Sanchez, 2016, p.28)

El trabajo de las académicas busca proponer un instrumento de medición de la variable eco-innovación en el ramo hotelero, pero también busca profundizar en las consecuencias ambientales que la eco-innovación propicia a través de la relación entre el desempeño ambiental y la eco-innovación por unidades de hospedaje, con la finalidad de generar conocimiento

en los estudios cuantitativos de temas ambientales con las técnicas multivariantes de enfoque independiente.

El trabajo desarrollado plantea la hipótesis siguiente:

*H1:* Existe una relación positiva y significativa entre eco-innovación y desempeño ambiental en hoteles de Oaxaca, México.

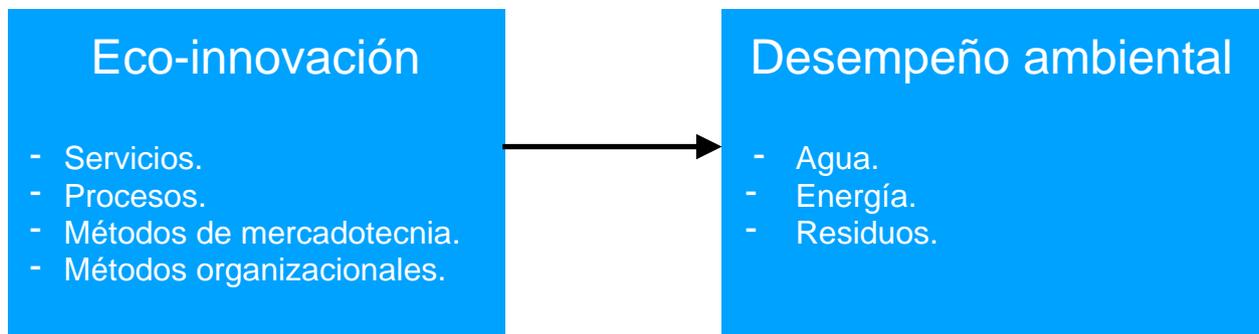
Lo anterior con base en Shrivastava (1995) el cual señala que las eco-tecnologías como un insumo estratégico que potencialidad a la empresa, y que éstas, a través de ellas generarán ventajas competitivas y consecuentemente se verá reflejado en un mejor desempeño ecológico.

El estudio se aplicó en 130 hoteles de la mayor categoría, 3, 4 y 5 estrellas, ya que en algunos trabajos se ha identificado que los mismos son los más

proactivos en los temas medioambientales, por lo que es más factible también encontrar el uso de eco innovaciones que en los hoteles de un menor número de estrellas. (Carmona, Céspedes y Burgos, 2004; Molina, Claver, Pereira y Tarí, 2009).

Los datos se obtuvieron mediante un cuestionario con reactivos e respuesta estructurada, el cual se aplico mediante entrevistas cara-cara, cabe señalar que según las autoras, los entrevistados fueron señaladas por los responsables de las organizaciones como las personas más idóneas para contestar las preguntas planteadas, en lo general fueron los gerentes y dueños de los hoteles y la recolección de datos duro un periodo de un año 2014-2015. Reyes y Sanchez (2016).

Las variables utilizadas fueron de acuerdo al siguiente constructo.



Según (Kemp y Pearson, 2008; Rennings, 2000), la eco-innovación hace referencia a la propiedad de las organizaciones productivas de bienes o servicios, para el desarrollo o modificación de servicios, procesos, métodos organizacionales o de marketing

que pueden contribuir de una manera favorable al medio ambiente.

En el análisis factorial realizado se detectaron cuatro dimensiones las cuales corresponden a la variable eco-innovación:

Factor 1	Factor 2	Factor 3	Factor 4
Servicios	Mercadotecnia	Procesos	Método organizacional

Los factores correspondientes a la variable eco-innovación obtuvieron un un 78% de la Varianza y un Alfa de Cronbach de .941

El desempeño ambiental es el impacto de las actividades de la organización sobre el medio ambiente.

Reyes y Sanchez (2016) afirman; "A nivel operacional se le considera como el cambio que presenta la organización en el aspecto ambiental en comparación con el period de tiempo anterior (un año)"(p.31).

En el análisis factorial de desempeño ambiental se encontraron tres factores que corresponden a:

Factor 1	Factor 2	Factor 3
Residuos sólidos	Energía eléctrica	Agua

Las factores correspondientes al desempeño ambiental muestran una varianza explicada del 76% y obtuvieron un Alfa de Cronbach de .872. lo cual muestra similitud con los resultados obtenidos en la medición del desempeño ambiental obtenida en el trabajo de

López, Molina, y Claver (2009), citados en Reyes y Sanchez (2016).

a) *Discusión*

El método utilizado y desarrollado por Reyes y Sanchez (2016) en esta investigación pone en evidencia el uso de eco-innovaciones en la industria hotelera, el hecho de su medición y los cambios conseguidos en los servicios, procesos, métodos organizacionales y métodos de marketing en los hoteles por medio del Análisis Factorial de Componentes Principales.

De tal manera los resultados arrojan una fuerte relación entre desempeño ambiental con sus dimensiones energía, agua y residuos. Sin embargo la relación que se muestra con el mejor uso del agua no se observa en las eco-innovaciones en el servicio, ya que las mismas son usadas por lo huéspedes y no con el personal de la organización, ya que estos tienen mayor participación en las eco-innovaciones de procesos y métodos organizacionales.

Para el caso de la eco-innovación en servicios se tiene una relación positiva y significativa con desempeño ambiental y con sus dimensiones energía y residuos. Para el caso de las eco-innovaciones en procesos no se logra impacto en un menor consumo eléctrico. Lo anterior puede obedecer al hecho de que los equipos eléctricos son utilizados de forma constante, aunque en las áreas de servicio el consumo varía de acuerdo a los hábitos de consumo y la ocupación de huéspedes.

Por su parte los residuos en la parte de servicios como de métodos organizacionales presentan una disminución de la cantidad de residuos generados.

Tabla con los componentes del Análisis factorial de la eco-innovación.

	<b>1. Servicios. Modificaciones en áreas para:</b>	<b>2. Mercadotecnia.</b>	<b>3. Procesos.</b>	<b>4. Organización. Desarrollo de personal en:</b>	
	Uso eficiente del agua.	Imagen pública ambiental.	Formas y dispositivos para la reutilización del agua.	Uso racional del agua.	
	Uso eficiente de la energía eléctrica.	Mercados y consumidores verdes.	Acondicionamiento de áreas con materiales naturales y/o locales.	Uso racional de la energía eléctrica.	
	Uso de luz y calor natural.	Patrocinio de acciones ambientales.	Adopción de suministros ambientalmente amigables.	Manejo de residuos sólidos.	
	Manejo de residuos sólidos	Vinculación comercial.		Mantenimiento de áreas naturales.	
	Adopción de productos orgánicos.	Promoción y venta de productos naturales.		Formas para motivar un mejor comportamiento ambiental.	
	Adopción de productos locales.				

	Modificación de espacios.				
	Factor 1	Factor 2	Factor 3	Factor 4	Comunalidad
Varianza total explicada	28.430	19.136	15.267	15.196	78.030
Alfa de Cronbach	0.943	0.916	0.897	0.858	0.941

Fuente: Elaboración propia con base en los datos presentados en Reyes y Sanchez (2016)

Tabla con los componentes del Análisis factorial del Desempeño Ambiental.

	1. Volumen de residuos sólidos generados.	2. Consumo de energía eléctrica.	3. Volumen de agua utilizada.	
	En la áreas utilizadas por los huéspedes.	Iluminación en las áreas utilizadas por los huéspedes.	En la áreas utilizadas por los huéspedes.	
	En el resto del hotel.	Iluminación en el resto del hotel en áreas de procesos:	En el resto del hotel.	
	Volumen de residuos sólidos reutilizados.	Uso de aparatos eléctricos en la áreas utilizadas por los huéspedes, es:	Volumen de agua contaminada con elementos químicos.	
	Volumen de residuos sólidos manejados adecuadamente en áreas de procesos	Uso de aparatos eléctricos en las demás áreas de procesos.	Volumen de agua reutilizada.	
		El nivel de aprovechamiento de la luz natural es:		
		El nivel de aprovechamiento del calor solar es:		
	Componente 1	Componente 2	Componente 3	Comunalidad
Varianza total explicada	26.796	26.792	22.662	76.251
Alfa de Cronbach	0.920	0.907	0.896	0.872

Fuente: Elaboración propia con base en los datos presentados en Reyes y Sanchez (2016)

### III. CONCLUSIONES

Los trabajos presentados son contribuciones realizadas por los autores y tienen la finalidad de avanzar en la cuantificación por métodos cuantitativos como lo es el Análisis Factorial por Componentes Principales, en la dimensión del diseño de la ecoinnovación.

Como se mencionó los resultado encontrados en los trabajos expuestos podrían ser de gran utilidad para los tomadores de decisión tanto en el ámbito público como en el privado. De esta manera el Análisis Factorial mostró las características en las cuales se debería poner mayor atención de acuerdo con el nivel de relación entre las variables mostradas en cada uno de los trabajos y su impacto medio ambiental.

La evidencia encontrada por los autores justifican plenamente la eficacia en el uso del instrumento cuantitativo. Lo anterior se comprueba en los dos estudios, en el sentido de que se encontró lo que acontece en la esfera mundial.

La eco-innovación, deberá ser concebida como cualquier forma de innovación, debe tener como propósito el alcanzar las metas de desarrollo sustentable 2030, por medio de la disminución del impacto ambiental negativo y a su vez deberá de velar por el uso y diseño inicial o modificaciones más eficientes y consientes tanto en el uso, consume y reutilización de los recursos naturales incluyendo desde luego el uso de la energía y el Análisis Factorial servirá como método para modelar, organizar, estructurar y entender el funcionamiento de los sistemas de producción. Pero además nos permitirá el simular y predecir el impacto ambiental y la introducción y el diseño de las ecoinnovaciones en la generación de bienes y servicios.

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GLOBAL JOURNAL OF MANAGEMENT AND BUSINESS RESEARCH: G  
INTERDISCIPLINARY

Volume 21 Issue 3 Version 1.0 Year 2021

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4588 & Print ISSN: 0975-5853

## Least Risk Bomb Location Explosives Identification, Detection and Mitigation

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**Abstract-** This paper investigates the still evolving strategic trajectories and the context adopted for the procedures for inducting a Least Risk Bomb Location (LRBL) that began with discretionary participation by various aircraft manufacturers approximately in the year 1972, where the use of a specific procedure has been designed to decrease the effects of an explosion significantly in the aircraft's passenger cabins of large commercial airplanes. Additionally, the International Civil Aviation Organization (ICAO) has provided the information on the location of the LRBL and guidance to various operators (National/International) on the procedures to use when a suspected threat item is found on-board an airplane. The designation of LRBL for aero planes is intended to be used solely for the transport of cargo, where an aero plane must include a designated location where a bomb or other explosive device could be designated to protect integrity of the structure and flight-critical systems from damage in the case of detonation occurs.

**Keywords:** aviation study, flight-critical structures, bomb & IED's, damage on detonation.

**GJMBR-G Classification:** JEL Code: F52



*Strictly as per the compliance and regulations of:*



# Least Risk Bomb Location Explosives Identification, Detection and Mitigation

Neha Bhatia

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## I. INTRODUCTION

This paper aims to explore and assess the still emerging strategic trajectories of the airport security means and the mitigation of the threat caused due to a suspected bomb on-board which can be effectively reduced. Supposedly, if a cabin crew or a ground staff of an operator receives a bomb threat, or finds a suspicious package on-board, what shall be the procedure as per various operators around the globe to follow, is apparently the works to articulate and implement the path forward by each operator to reduce the damage to an aircraft to best protect the integrity of the aircraft's structure.

We all have probably heard the Shoe Bomber attempt from the year 2001, which was thwarted by some brave passengers and crew, and also the fact the bomber had sweaty feet where his swamp foot dampened the trigger preventing it from igniting.

Similarly, In the year 2016, an aircraft made an emergency at HCMM/Mogadishu airport after a bomb exploded on-board. Another incident, where the bomb was likely brought on-board concealed within a laptop, in which the flight was lucky though because the impact

of the bomb was minimal, limited because the bomb exploded while the aircraft was at a lower altitude (11,000ft). In the year 2020, a European airline found a 'bomb note' on-board, which was escorted to a safe landing and passengers disembarked without incident.

We do anticipate about potential bomb threats, and attempted bombings, do occur, and while security is getting better and better, unfortunately terrorists are getting more creative in finding ways to bring dangerous suspected devices on board. The attempts are not always aimed at causing destruction either, though threats alone cause a huge amount of disruption to operations. So understanding how to assess the risk and credibility of a threat is as important as knowing how to deal with a possible explosive device if one is found on-board.

## II. LITERATURE REVIEW

On being told or somehow finding out that the aircraft on which you are flying has a bomb on board, or even finding such a device unannounced and unsure, must be one of the most feared experiences in the world of flying even today. As humans our mind instantly focuses on the horrors of the Air India flight over the Atlantic in 1985 and Pan Am flight 103 over Lockerbie in 1988, before going numb. These horrors are all too apparent, but preparation in the event of such an occurrence can help increase the chances of a successful outcome and the survival of all the souls on board. Bomb threats received by airlines, of which there are many, are normally handled at the airline's base by a team devoted to such work and the decision is made there as to whether the threat is a serious one or just a hoax. If, as fortunately rarely happens, the threat is considered to be real, the first procedure is to contact the Captain of the aircraft and inform him of the situation. The procedures in a serious bomb threat situation vary according to the location of the aircraft and if the aircraft is on the ground, a controlled evacuation should take place. The bomb disposal teams also play a very essential role in such a situation, as they are supposed to start at one end of the aircraft and work through everything in their search until they find the offending device.

Data on emerging air markets and risks involved are extremely challenging, and what are available must be carefully considered in terms of accuracy and veracity. Following simple precautions,

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and every airline having its own detailed procedures of what to do in case of a bomb threat may not lessen the trauma of being on an aircraft with a bomb on board but warning of the device gives crew members the greatest chance of preventing a disaster that can endanger the safety of the aircraft and the lives of all on board.

A literature forage was conducted to recognize that every threats must be assessed to determine its significance and the risk associated to adopt appropriate measures to be implemented to eliminate the cause of nuisance that is intended by any potential suspected device found on-board an aircraft or in airport facilities. The search yielded three major categories of relevant past efforts, firstly, the characteristics of Bomb threats with large number of efforts involving the simulation analysis of disaster management. Secondly, a variety of contingency plan related research efforts directed at improving emergency response efforts for an assessment of the warning and the risk involved, by designated and accredited personnel (Bomb Threat Assessors / PNP AVSEGROUP Special Operations Unit) employing Positive Target Identification (PTI). Thirdly, relevant research efforts include a series of assessment of the risk posed by a bomb warning on the Ground as well as in the Air. These include bomb threat action in consultation with the police and other appropriate agencies, each aircraft operator, airport and cargo agent should develop contingency plans to be implemented when bomb warnings issued against it are assessed as RED or AMBER to reduce the risks arising from such bomb warnings.

### III. AIRCRAFT'S DESIGN CONSIDERATIONS & HARMONIZATION

A key theme that has emerged in this study's data concerning the Code of Federal Regulations (CFR), part 25, § 25.795(c), "Least risk bomb location." With regards to the aircraft's design considerations researchers have assessed that because the voluntary approach has identified the LRBL after the basic design of the aircraft was complete, it did not provide the safety improvements that are possible when the LRBL is included in the initial design process therefore, additional features may need to be explored to improve safety. Design considerations may include specially-sized areas or pressure relief panels in the cabin structure where a suspect device should be placed by the operating crewmembers. On airplanes with more than one passenger deck, more than one LRBL may be desirable which provided a related Advisory Circular harmonizing with the European Joint Aviation Authorities (JAA). That draft provided a method of compliance that both the FAA and JAA found acceptable and subsequently, the European Aviation Safety Agency (EASA) was formed as the principal aviation regulatory agency in Europe, resulting the FAA working with EASA

to ensure that the proposed Advisory Circular is harmonized with the draft referred to in EASA's Certification Specifications.

The sub-theme of aviation security invariably linked to issues and controversies surrounding the fear of bomb threat within air fliers subsequently enacting the government to constitute a regulation for airlines, and notions of what to provide in guidance for LRBL design as well as establish critical parameters that need to be addressed to demonstrate compliance with the requirements of Title 14, Code of Federal Regulations (CFR), part 25. The accurate design of constructing an LRBL includes the amplifying effects of the differential pressure between the cabin and the outside air, which can be significant. The perfect structure of LRBL sustains the maximum damage when an explosion occurs in a fully pressurized airplane.

When a suspected item is found in the cabin of an airplane in air, measures to minimize its effect should include few procedures. Firstly, reducing the aircraft's cabin pressure, with full depressurization and to reduce the damage caused by an explosion; secondly, minimizing the loss of integrity of the structure or systems; thirdly, using explosive containment devices; and, lastly, conducting operational procedures established in consideration of the airplane performance.

While it is important that the crew should be aware of the LRBL, the LRBL should not be marked or otherwise obvious to other persons. Close coordination among the airframe manufacturer, operator, and regulatory authorities is needed in order to maximize the effectiveness of the LRBL and associated procedures.

### IV. DEMONSTRATION OF COMPLIANCE FOR AIRCRAFT MANUFACTURERS AND AIRLINE OPERATORS

When determining the preparation of LRBL, there are few operational and design issues that should be addressed, like If the applicant chooses a site adjacent to the fuselage skin, the applicant should assume that a portion of the structure will be lost. The applicant should determine the structural capability of the airplane in the presence of the resulting opening. For example, if the LRBL is a door, it should be assumed that the entire door is lost. If the area is not a door, the following factors should be considered:

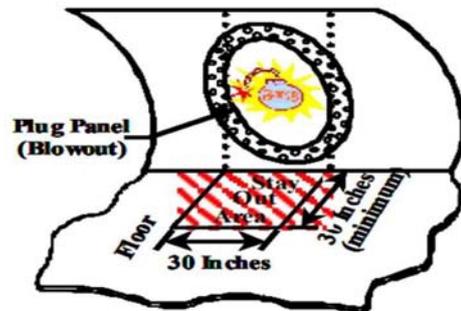
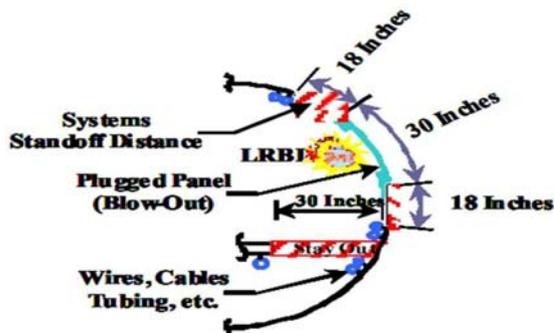
- a) When using this approach, the LRBL fuselage-skin blowout area must be discontinuous from the surrounding structure, so that cracks developed in the blowout section cannot propagate into the surrounding structure.
- b) The dimensions of the LRBL blowout region should be no smaller than a 30-inch diameter circle. However, the dimensions may be reduced to no less than a 20-inch diameter circle, if the basic

airplane geometry and other considerations prevent a larger diameter.

- c) Adequate space must be available to place the attenuating materials required by the operational procedures.
- d) The LRBL should allow the suspect item to be placed as close to the fuselage skin as possible. That is, interior features, such as galleys, closets, and seats, should not obstruct access to the LRBL or the space available for the LRBL.

The location of the LRBL should include considerations of the secondary effects, including the aircraft structural losses, ingestion of debris into the

engine, large mass strikes on the tail plane, smoke or fire, and the hazards to passengers. The applicant should also evaluate system integrity in the area likely to be affected around the LRBL. Wherever practicable, flight critical systems (including fuel systems) should be kept 18 inches away from the established LRBL contours, as shown in Figure below. In addition, flight critical systems should be kept out of the area under the floor at the LRBL for a distance of 30 inches inboard over the width of the LRBL cut out, also shown in Figure below. This applies to systems that are attached to the floor beams or mounted above the bottom of the floor beams.



As we can see in the figure above, here in this case, the applicant should consider adding protection from fragments and large structural deformation to systems that must be run in proximity to the LRBL. Systems shielding and/or inherent protection should be able to withstand fragment impacts from 0.5-inch diameter 2024-T3 aluminium spheres traveling 430 feet per second. The ballistic resistance of 0.09-inch thick 2024-T3 aluminium offers an equivalent level of protection. System designs must incorporate features that minimize the risk of their failure due to large displacements of the structure to which they are attached. This may include flexibility in both the systems and/or their mountings. In the absence of test evidence or alleviating rationale, provisions should allow for a minimum 6-inch displacement in any direction from a single point force applied anywhere within the protected region. The applicant may also incorporate frangible attachments or other features that would preclude system failure. During early years of aviation threats, the LRBL was chosen where there was intrinsic structural reinforcement, however, the applicant may take other measures to meet the intent of the rule. An example would be a containment system. Such an approach would require the concurrence of the applicable Aircraft Certification Office and the Transport Airplane Directorate to establish the appropriate criteria. In most circumstances, it is preferable to reduce the cabin pressure differential to zero. Reduction of cabin pressure is an extremely effective way to minimize structural damage in the event of a detonation. The goal

of LRBL procedures is to mitigate the effects of an in-flight explosion and to enhance aircraft survivability through use of prior planning, training, and available resources.

After all the substantial data gathered it is evaluated that threats received regarding an aircraft need to be assessed, and the credibility needs to be determined. The threat classification will generally be based around how specific the threat is, depending on which most of the airline operators will have a procedure in place for determining this, and probably take into account about the following: Once talking about the term Red Threat, it often refers to a threat that mentions a specific target, or is made by a known terrorist organization and is deemed credible then this is going to be considered more serious, whereas, a threat which is vague, general, and doesn't specify targets might be considered less credible in comparison. A hand scribbled note in the toilet for example, would be categorized as a green threat.

Considering a bomb threat to be genuine or hoax in nature, irrespective of the assessed credibility, a bomb threat has to be taken seriously and treated as a genuine situation.

## V. RECEIPT OF BOMB THREATS & ACTION BY RECIPIENT

Telephoned bomb threats may be received by airports, aircraft operators and cargo agents either directly from the people issuing the threats or from

intermediaries (e.g. the media, press agencies etc.). In either case, recipients should endeavour to obtain as much information as possible about the warning in order to facilitate assessment of it and identification of the person issuing it. Staff who are likely to receive bomb warning calls, telephonists and sales staff, should be briefed on the subject on taking up their duties, and the responses required from them should be incorporated into appropriate staff instructions. Every staff involved in such work areas should be provided with checklists to facilitate their reactions. Supervisors should be similarly aware of the response required and of the need to relay information about bomb warnings to Bomb Assessors. Any staff receiving warnings directly should listen carefully and make a note of the actual words used by the caller, either take action to trace the call or alert a colleague in order that they may do so; take such action as may be necessary to tape record the call, where this is not done automatically; try to prolong the call to obtain as much information as possible; and lastly try to ask the caller:

- WHERE is the bomb?
- WHEN will it go off?
- WHAT does it look like?
- WHY are you doing this?
- WHO are you?

If possible, the recipient should test the credibility of the caller by making up a non-existent flight number, flight time or location and asking the caller whether that is the one to which he or she is referring and then immediately inform a supervisor who will, in turn, inform the Bomb Threat Assessor / AVSEGROUP SOU; the police; and the Administrator OTS.

People receiving calls from intermediaries should ask for, and make written note of, the precise

time at which the warning was issued and the exact words used by the caller; and simultaneously ask whether the intermediary obtained answers to any of the questions detailed above, and about the origin of the call and the caller's identity, using the headings on the reverse of the Bomb Warning Report Form. The recipient of a written bomb warning should preserve the message and deliver it to the supervisor with precise information about its discovery. Messages discovered in flight should be referred to the aircraft captain immediately, whereas, the supervisors should interview the recipient of any call or message in order to complete the Bomb Warning Report Form, and relay it without delay to the Bomb Warning Assessor.

a) *If aircraft is on ground*

One of the safest option for every operator and cabin crew on the ground, is to disembark and carry out a full search of the aircraft. Although the process might be very tedious and may cause operational delays, but the possible alternative may be much worse. A serious threat may require a precautionary deplaning of the on-board passengers which will result in offloading the passengers as quickly and as safely as possible. The situation here creates a remarkable risk to safety of all the souls onboard in itself and also the credibility of the threat will be communicated to the cabin crew so that they can judge the risk of waiting for the regular step ladders to arrive or to immediately evacuate passengers to clear the aircraft. There might also be a risk involved in evacuating passengers in the tarmac without having any backup from the airport for passengers as passengers may be hurling around the tarmac.



b) *If the aircraft is in Air*

Imagine a threat is received while an aircraft is in the cruise phase. In such a crisis, the cabin crew are trained to carry out a search, checking all the potential places that are often overlooked during the ground security checks, but where an article might easily be concealed that may be toilets, galleys, jump seats, stowage areas, closets etc. The advised theory here is

to carry the process discreetly to avoid unnecessary panicking amongst passengers. Whereas, if an article is found, then cabin crew is trained specifically not move it or touch it, but rather move passengers away from the immediate area, and remove any flammable items and have fire extinguishers readily accessible to fight the fire. Following this an announcement to page for anyone on-board with 'BD or EOD experience' is again being

advised by airline operators, as these are the terms that only the concerned will recognize without the normal passengers getting intimidated. Keeping the passengers calm in such a crisis may probably be the best call of the situation, but ensuring that passengers are following the crew's orders, and that they are prepared for the situation on the ground, is also imperative, which means providing them with clear information, but without exaggerating the situation.

c) *If a suspicious article is found*

Almost every aircraft manufacturer provides their approved checklists for bomb-on-board situations, amongst which are a few measures that needs mandatory considerations.

- A continuous communication with ATC is mandatory so that they know exactly what is going on and what is exactly needed. The ATC and the team involved assists with locating an airport with services needed, and coordinates with military if necessary.
- It is advised to avoid routes over heavily populated areas and consider carefully the choice between flying fast to minimize airborne time versus flying slow to minimize air-loads and damage (in the event of fuselage rupture).
- It is also advised to the Pilot to request for a remote parking on the ground if there isn't a designated bomb location.

- Also, a rigorous briefing by pilot to all the operating cabin crew members for a possible emergency landing, and in any event, brief them to ensure passengers are disembarked quickly and moved to at least 200m upwind from the aircraft, needs to be done, as an SOP in case of a bomb threat.
- It is a recommended practice for all the pilots to avoid large and rapid changes to pressure altitude and consider using manual cabin altitude controls to minimize the rapid change of pressure while still lowering the aircraft cabin altitude to minimize the differential pressure.

Aircrafts are designed to not 'explode' if there is a rupture in the fuselage due to which they tend to have a lot of smaller sections attached together, making the overall aircraft structure way more resilient to the effects of an explosive decompression. The idea of reducing the differential pressure to around 1 PSI also reduces the damage if an explosion occurs, whereas, maintaining a slight differential pressure ensures that the blast moves outwards, but the lower differential limits the force of air from the cabin outwards.



Bomb exploded at low altitude so differential pressure was lower

## VI. AIRCRAFT'S LRBL AS CERTIFIED BY MANUFACTURER

As prescribed by every aircraft manufacturer a Least Risk Bomb Location are often near aft/rear doors or in washroom stowage areas, which provides the least risk, in the event of an explosion, to flight critical structures and systems. If the suspected device is deemed unsafe to move/or turns out to be an anti-lift device, then the cabin crew needs to cover it in plastic to prevent any liquids getting in, and then pile blankets

and pillows, seat cushions and soft clothing around it. It is also recommended to build as big a pile as the crew can, and once done, saturate in water to minimize fire risk in case an explosion does occur. Also a thick and prominent layer surfacing of the plastic sheets on top of the suspected device should be placed mandatorily to avoid liquid damage to electrical components. In case of ruling out that the suspected device isn't an anti-lift and the cabin crew can possibly move it to the least risk area, an LRBL should be constructed and the suspected item should be placed as per the guidelines

of the operator's manual, and subsequently building up the barricade.

It is always suggested to minimize movement to any article as much as possible, and restrict putting anything directly on top of it. An igloo of saturated



cushions around it and the gaps stuffed with blankets and clothes is a standard recommendation for LRBL. This 'cushioning' helps to minimize the force if an explosion does occur.



At any instance a cabin crew happens to discover a suspected Improvised explosive device (IED) in an aircraft, it is recommended by the manufacturers as well as the airline operators in their manuals that the operating pilots must descend and depressurise the aircraft cabin before the suspicious item is physically placed in the LRBL by the cabin crew. Once mentioning the responsibilities of cabin crew members, they intend to have the most critical role of identifying and preparing the LRBL and moving the suspicious device to this specific location. Now, this suspected device should be placed extremely close to the fuselage bearing in mind about the extremities in case of a loss of portion of the aircraft, should the device detonate. Every manufacturer has a manual with the guidelines being specific on the designated location of LRBL which is usually one furthest away from the critical structures; which are the flight deck, fuel tanks and in an area designed to 'open' i.e.; the aircraft door. The on-board duty of a cabin crew in this situation always shall be to move the IED after ruling out the possibility of the device being anti lift, simultaneously escorted by other crewmembers collecting items such as seat covers and suitcases for placement at the LRBL. The built of LRBL base needs to be essentially very strong at the bottom, having built upwards in the shape of a pyramid as thick as possible, with all the possible items that may be collected by cabin crew on-board, requiring suitcases and other heavy materials surrounding it, more of the force from the bomb should be pushed outside causing the shock front travelling better through denser materials. The use of dampened blankets is then placed immediately above the suspected device, and eventually separated from it by a sheet of plastic such that in the event of a blast, the water uses up the heat energy by converting it into steam. The use of softer materials, such as cushions and clothing, are then placed above the blankets, as it is proven to be poor mediums for

transmitting shock whilst also diminishing the effect of any fragmentation.

In case the IED does not detonate, upon landing, a trained EOD/BDDS unit shall be called upon to take control of the aircraft where the position of the suspected IED within the stack should be identified by using an item such as a rope or a cable (prior marking done by cabin crew). When on the ground, passengers should be evacuated as safely and as quickly as possible to a safe zone.

## VII. CONCLUSION

Crewmembers shall potentially have very minimum chances to experience an IED threat on their aircraft having extremely tight security procedures and technological improvements that precede each flight. Also that most bomb threats are a false alarm which do not involve actual explosives, but only the incitement of fear making the job of cabin crew ready for all eventualities by knowing how to react effectively. If a suspicious device is detected inside the aircraft, the most effective response is clear, albeit time consuming, hence to reduce the reaction time every airline operator must ensure that crewmembers' training must be regular and, importantly, easily integrated with specific aircraft design.

The concept of LRBLs were not considered in the design of most aircraft and there is scope for prospective safety improvements rather than the retrospective considerations currently in place. The incorporation of a bomb containment area or casing and/or pressure relief panels would both reduce the time to effective containment of an IED by crewmembers and reduce the impact of a blast wave causing minimum structural damage to an aircraft and casualties. New containment bags such as a 'Fly Bag', should be tested on passenger flights that can easily be produced in





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GLOBAL JOURNAL OF MANAGEMENT AND BUSINESS RESEARCH: G  
INTERDISCIPLINARY

Volume 21 Issue 3 Version 1.0 Year 2021

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4588 & Print ISSN: 0975-5853

# Key Factors Affecting E-Health Adoption among Young Adults in Malaysia

By H. Muchlis Gazali & T. Amboala

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**Methods:** Extending the Technology Acceptance Model (TAM) with Personal Innovativeness in IT and Social Influence. This paper presents the conceptual foundation on the adoption of e-health among young adults in Malaysia.

**Keywords:** e-health, TAM, Malaysia, Personal Innovativeness, Social Influence.

**GJMBR-G Classification:** JEL Code: I15



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# Key Factors Affecting E-Health Adoption among Young Adults in Malaysia

H. Muchlis Gazali<sup>α</sup> & T. Amboala<sup>σ</sup>

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**Results:** These initial results suggest a link between TAM, PI and SI towards the adoption of e-health. These findings may help us to better understand the adoption behaviour among young adults towards the application of e-health.

**Conclusion:** This study offers a fresh perspective on the e-health adoption among young adults in Malaysia. The present study adds to the growing body of literature on e-health adoption in Malaysia. This study is relevant to both practitioners and policy-makers. Due to the conceptual constrain, this paper cannot provide a comprehensive evidence on the e-health adoption from the empirical point of view. Further studies on the current topic are therefore recommended to develop a full picture of e-health adoption which take these variables into account.

**Keywords:** e-health, TAM, Malaysia, Personal Innovativeness, Social Influence.

## I. INTRODUCTION

Technological landscape often changes very rapidly. Human personal life is highly dependent on the technology that being developed. This technological advancement has changed the way people live their life such as the communication, travel, learning and shopping, just to name a few. The technological changes also influence the health sector is. The innovation and deployment of technology in the health sector improves the service delivery and outcomes [1]. Prior research has conceptualised the electronic health as all services, a system and activity relating to patient health and supported by technology [2]. The use of e-health application is more prevalent. For instance, researchers have discovered that people are using the e-health application to monitor their health and wellness, to monitor disease and to increase their fitness [2].

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Malaysia, like many other developing countries has invested a substantial amount of resources in the e-health system. For instance, in the RMK-11 (2016-2020) the Malaysian Government focused to develop the National eHealth by strengthening the current system with a robust ICT system [3]. In recent years, researchers have shown an increased interest in health technology adoption [1], [4], [5]. In as much the prior research confirms that positive impact of e-health technology, the researchers also highlighted the subtle nuances of the factors that lead to the adoption and utilization of e-health technology especially in developing countries [1]. Several attempts have been made in the context of Bangladesh, German, India and China [4][5][6][7]. Moreover, most of the empirical evidence come from developed countries like the United States, Canada and Australia [8]. Despite the importance of health technology benefits, there has been little discussion about e-health adoption from Malaysia perspective.

According to the Department of Statistics Malaysia (DOSM)[9], for the third quarter of 2019, the Malaysian population was 32.63 million in estimation. A survey conducted by the DOSM in 2018 revealed that around 81.2% of individuals aged 15 years and above in Malaysia used the internet[10]. The main activities of internet usage by individuals are like participating in social networks, finding information about goods and services, downloading software or applications, telephoning over the internet and many more. Furthermore, approximately 98.2% of the household in Malaysia access the ICT via mobile phone. This is an indication that a mobile phone is one of the most important devices in the modern life of which indirectly increases people health care via the e-health application.

The main aim of this study is to develop a model of consumer adoption on electronic health (e-health) in Malaysia. Thus, this study seeks to obtain the key factors affecting e-health adoption among young adults in Malaysia. This conceptual paper offers a conceptual framework from the extension of the Technology Acceptance Model with other two extended variables, which are the Perceived Innovativeness on IT and the Social Influence. This paper is composed of four distinct sections. This paper begins with the introduction. It will then go on to the discussion of Technology Acceptance Model (TAM), Personal

Innovativeness and Social Influence. Next is the discussion on the conceptual model followed by the discussion on reshaping Takaful and insurance industry with e-health application. The final section concludes the study and provides the implications, limitations of the study and recommendations for future research.

## II. TECHNOLOGY ACCEPTANCE MODEL (TAM)

The Technology Acceptance Model (TAM) was introduced by Davis in 1989 [11]. In his seminal paper, Davis establishes a better measurement for predicting and explaining. TAM was considered as the modification of TRA Ajzen and Fishben [12]. According to TAM, there are two important antecedences which explain the determinants of system in use; the Perceived Usefulness (PU) and the Perceived Ease of Use (PEOU). A large and growing body of literature has widely documented the TAM model that explain the ICT adoption such as [4], [6], [13]–[16].

### a) *Perceived Usefulness (PU)*

TAM proposes that PU influences attitudes and sequentially influences the behavioural intention. The Perceived Usefulness (PU) refers as the degree of a person's belief in using a particular system that it would enhance their job performance. There is a large volume of published studies describing the role of PU towards the ICT adoption [14]–[18]. For instance, Rouibah, Ramayah and May [15] utilised PLS to understand user acceptance of internet banking in Malaysia. Their study found that PU is one of the key determinants that explained behavioural intention to use e-banking in Malaysia. Similar finding was found when Kallanmarthodi and Vaithiyathan [19] tested TAM among the e-banking customers in Coimbatore City, India. Thus, in the context of e-banking adoption, PU was identified as a vital determining factor on the adoption of a particular system.

Although, several lines of evidence has reported the role of PU in shaping behavioural intention prior studies have failed to demonstrate any convincing evidence on the role of PU towards the adoption of e-health especially from the developing countries like Malaysia. By far the most recent evidence conducted in Malaysia is a study by Saare, Hussain and Yue [13], yet the sample of their study was among the Iraqian Older Adults. Thus, it is relevant to study the role of PU in the context of e-health.

### b) *Perceived Ease of Use (PEOU)*

Perceived Ease of Use (PEOU) refers to the degree which a person believes that using a particular system would be free from effort [11]. Several lines of evidence suggest the importance of PEOU of acceptance. For instance, Jackson and Yark [20] confirmed that PEOU has positive relationship towards the acceptance of information technology. They

discovered that highly innovated individuals tend to embrace change. A recent study in Bangladesh by Hoque et al. [4] found that PEOU is one of the vital components on the adoption of e-health among patient's in Dhaka City. Hoque extended their analysis and investigated the gender differences towards the intention to utilise e-health. They found that male and females have different perspective on e-health adoption, where the male shows that PEOU has stronger influence on e-health adoption. Thus, they suggest that gender also has significant influence on technology adoption. Contradicting with the previous findings, another line of evidence from Bangladesh revealed that the PEOU does not influence the adoption of e-Health.

Khan et al. [6] aimed to investigate the factors that influence the African expat's intention on e-health in China. Khan confirmed previous findings by Hoque [4] when they validated that TAM is a strong predictor on the e-health adoption among the African expats in China. Khan [6] findings are slightly different from the previous findings, as they revealed that PEOU was less essential compared to PU in users acceptance of technology. PEOU is also captured in Arkorful et al. [1] findings in their study of role of electronic health among health practitioners. The health practitioners feel comfortable and convenient by utilising the health technology, thus the PEOU is found to be the determining factor that serves the practitioners to use electronic health.

### c) *Personal Innovativeness (PI)*

Agarwal and Prasad [21] in their seminal paper on A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology has conceptualised the definition of Personal Innovativeness (PI) as the willingness of an individual to try out any new information technology. They emphasised that in the technology acceptance behaviour via its relationship with beliefs or perceptions manifested the influence of PI. In other words, [21] it symbolised PI as risk-taking propensity that exists in particular persons and not in others. Research discovered that the PI plays an important role in behavioural intention. For instance Lu [22], stated that a higher PI among individuals will lead to a more positive beliefs on the adoption of target technology.

There are a number of large cross-sectional studies suggesting the PI in technology adoption. Both theoretical and empirical evidence revealed the importance of PI in the innovation adoption process [23]. Recent study by Wijeyesundara and Xixiang [24] discovered the role of PI in technology in predicting the social networking site acceptance. They highlighted that prior study failed to prove the function of PI in SNS acceptance. The most important findings is PI positively influences PEOU of SNS. By utilising Unified Theory of Acceptance and Use of Technology (UTAUT), Jackson,

Yi and Park [20] also shown that highly innovate people have higher tendency to embrace change and have more positive feelings of PU, PEOU and Perceived Behavioural Control (PBC) towards innovation.

#### d) Social Influence

The terms of social norms in this study refers to subjective or normative pressure. Fishbein and Ajzen [25] defined social norms as individual's perception of the likelihood that the potential referent group to her/him think that he/she should or should not perform behavioural in question. Previous studies confirms the role of social influence as a motivation factors for the consumers to adopt new technologies [26]. However, studies have found mixed results on social influence as predictor of intention to use. For instance, Cheung and Lee [27] proposed a theoretical model for online social network. They discovered subjective norm and social identity determine the decision to employ online social network. In the context of online shopping, Shabrina and Zaki [28] revealed that subjective norms positively influence the intention to use online shopping. Furthermore, they found that the higher the subjective norms, the higher the effect towards intention to use online shopping.

In a study conducted by Ramayah, Rouibah, Gopi et al. [29] using a Decomposed Theory of Reasoned Action in determining intention to use internet stock trading among the Malaysian investors discovered that subjective norm has a significant direct relationship with intention to use stock trading. More importantly, social pressure could enhance the intention to use the internet stock trading among the investors.

### III. CONCEPTUAL FRAMEWORK

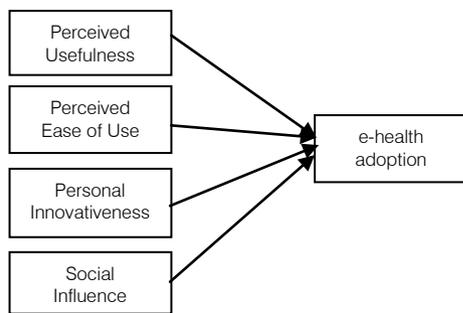


Figure 1: Theoretical Framework

### IV. RESHAPING TAKAFUL AND INSURANCE INDUSTRY WITH E-HEALTH APPLICATION

The adoption of Internet of things (IoT) nowadays could improve the current conditions or perhaps could assist in solving the dilemmas in coping with the rising number of people and ensuring that they are in the state of good health and are protected[30].

Perhaps, the advancement in health technology could shape the Takaful or insurance industry in providing a new business model, commercial partnership and consumer relationships[31]. The advantages of the convergence of health technology present a great potential for both the insurer and the insured person. With technological advancement, the professional can access the data that could improve the health and social care of their clients. On the other hand, the insurer, the industry players and the Takaful or insurance industry may provide better services based on the needs of the customers, provide incentive and engagement programs that improve the quality of life of the insured[30].

The big tech players in the industry eagerly involved in providing innovative health technology ecosystem. For example, Google builds certain applications like wearable with health tracking such as phones, tablets or smart watches[30]. All these devices are part of non-invasive underwriting evidences that provide sources of data that can improve people lifestyle and the habits of the users. Google claims that the built in features on such devices could assist in early detection of contagious disease or other malady. At the same time it aims to empower people in managing their disease better [30]. The weaknesses of previous Takaful and insurance business model is low adoption rates due to the products not relevant and accessible to the customers [31]. Thus, the service provider and the industry player should promote and ensure that the Takaful and insurance products and services are more appealingly.

### V. CONCLUSION

This study proposed a model on consumer adoption on e-health and discussed the key factors affecting e-health adoption among young intellectuals in Malaysia. This study used the extended version of the Technology Acceptance Model as the underpinning theory to explain better the e-health adoption. The discussion of this paper reveals that there are four important factors leading to the e-health adoption among the young adults in Malaysia such as perceived usefulness, perceived ease of use, personal innovativeness and social norms. Taken together, these findings suggest roles for the mentioned variables in promoting e-health adoption among young adults. Before this study, evidence of TAM was purely anecdotal. This study has been one of the first studies to compare the experience of e-health adoption in Malaysia. In addition, this study is relevant to both the practitioners and policy-makers. This study extends our knowledge of e-health adoption among young adults in Malaysia. Despite its conceptual nature, it would be interesting if further studies could establish empirical

evidence on the relationship between the mentioned variables towards e-health adoption.

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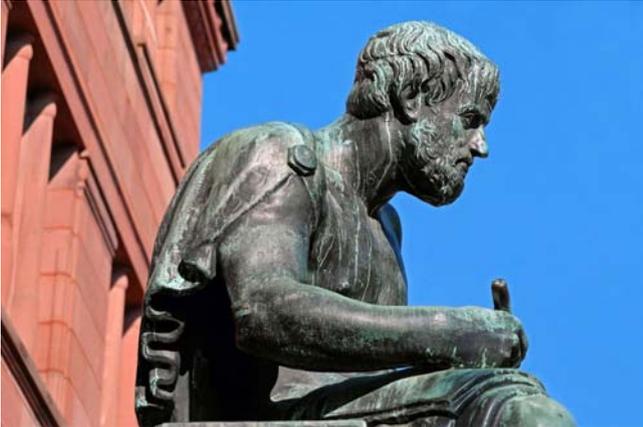
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The primary objective is to recognize the leaders in research and scientific fields of the current era with a global perspective and to create a channel between them and other researchers for better exposure and knowledge sharing. Members are most eminent scientists, engineers, and technologists from all across the world. Fellows are elected for life through a peer review process on the basis of excellence in the respective domain. There is no limit on the number of new nominations made in any year. Each year, the Open Association of Research Society elect up to 12 new Fellow Members.



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Career

Credibility

Exclusive

Reputation



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Career

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Reputation



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Credibility

Reputation

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Career

Credibility

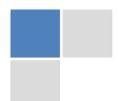
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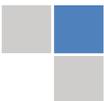
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3. Ensure corresponding author's email address and postal address are accurate and reachable.
4. Manuscript to be submitted must include keywords, an abstract, a paper title, co-author(s) names and details (email address, name, phone number, and institution), figures and illustrations in vector format including appropriate captions, tables, including titles and footnotes, a conclusion, results, acknowledgments and references.
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- Writings
- Diagrams
- Graphs
- Illustrations
- Lectures



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- Graphic representations
- Computer programs
- Electronic material
- Any other original work

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3. Final approval of the version of the paper to be published.

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### Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

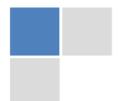
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Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.



### ***Manuscript Style Instruction (Optional)***

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

### ***Structure and Format of Manuscript***

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

- a) A title which should be relevant to the theme of the paper.
- b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
- c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
- d) An introduction, giving fundamental background objectives.
- e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
- f) Results which should be presented concisely by well-designed tables and figures.
- g) Suitable statistical data should also be given.
- h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

- i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
- j) There should be brief acknowledgments.
- k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

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The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

### **Author details**

The full postal address of any related author(s) must be specified.

### **Abstract**

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

### **Keywords**

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in a research paper?" Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

### **Numerical Methods**

Numerical methods used should be transparent and, where appropriate, supported by references.

### **Abbreviations**

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

### **Formulas and equations**

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

### **Tables, Figures, and Figure Legends**

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.



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Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

## PREPARATION OF ELETRONIC FIGURES FOR PUBLICATION

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Techniques for writing a good quality management and business research paper:

**1. Choosing the topic:** In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

**2. Think like evaluators:** If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

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**7. Revise what you wrote:** When you write anything, always read it, summarize it, and then finalize it.

**8. Make every effort:** Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

**9. Produce good diagrams of your own:** Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

**10. Use proper verb tense:** Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

**11. Pick a good study spot:** Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

**12. Know what you know:** Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

**13. Use good grammar:** Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice. Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

**14. Arrangement of information:** Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

**15. Never start at the last minute:** Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

**16. Multitasking in research is not good:** Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

**17. Never copy others' work:** Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

**18. Go to seminars:** Attend seminars if the topic is relevant to your research area. Utilize all your resources.

**19. Refresh your mind after intervals:** Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

**20. Think technically:** Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.



**21. Adding unnecessary information:** Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

**22. Report concluded results:** Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

**23. Upon conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

## INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

### **Key points to remember:**

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

### **Final points:**

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

*The introduction:* This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

### **The discussion section:**

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

### **General style:**

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

**To make a paper clear:** Adhere to recommended page limits.

### *Mistakes to avoid:*

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.



- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

#### **Title page:**

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

**Abstract:** This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

*Reason for writing the article—theory, overall issue, purpose.*

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

#### **Approach:**

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

#### **Introduction:**

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

*The following approach can create a valuable beginning:*

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.



**Approach:**

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

**Procedures (methods and materials):**

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

**Materials:**

*Materials may be reported in part of a section or else they may be recognized along with your measures.*

**Methods:**

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

**Approach:**

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

**What to keep away from:**

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

**Results:**

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.



**Content:**

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

**What to stay away from:**

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

**Approach:**

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

**Figures and tables:**

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

**Discussion:**

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.



**Approach:**

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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Topics	Grades		
	A-B	C-D	E-F
<i>Abstract</i>	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form  Above 200 words	No specific data with ambiguous information  Above 250 words
<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



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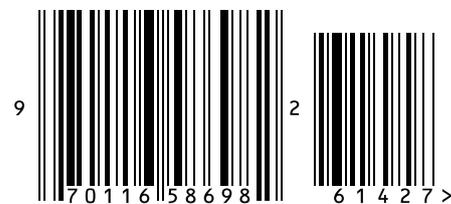
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ISSN 9755853

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