
AI and the Insolvency Profession: The State of Play

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Artificial intelligence (AI) is defined as the ability of a digital computer or robot to perform tasks normally requiring human intelligence such as logical deduction, learning or creativity. This article considers how the insolvency profession is currently being, and may in the future be, impacted by AI, what measures can be adopted to benefit from such digital disruption and what progress has been made towards a digital insolvency practice. In measuring such progress, this article reports the results of an online national survey of registered bankruptcy trustees and registered liquidators within Australia, conducted over July 2017 to February 2018. The aim of the survey was to investigate the risks and opportunities of technology-driven automation and innovation within insolvency. The article concludes with a discussion of the need for collaboration between key stakeholders within and outside of the insolvency profession to accelerate progress towards a digital insolvency practice.

I. INTRODUCTION

The insolvency profession, like many other professions, is currently experiencing digital disruption¹ because of a growing reliance upon technologies such as smartphones, cloud computing, data analytics and social media. The ability of such technologies to transgress professional boundaries means that professionals are no longer considered to be the sole custodians of specialist, complex knowledge and training.² Today, the insolvency profession's stranglehold on specialist knowledge is weakened and will continue to weaken in the future³ as new technologies, such as robotics and machine learning, defined generally as "artificial intelligence" (AI) continue to grow exponentially.⁴

Susskind and Susskind hypothesise that a society's information substructure, meaning the dominant way in which information is stored and communicated, affects what practical expertise is available, how it is created and shared, and who is able to access it and understand it.⁵ Central to their thesis is that over time the demand for traditional professions (the traditional gatekeepers of information, knowledge and practical expertise) and the conventional professional worker will decline and that information technology (IT) will drive this decline. Susskind and Susskind also suggest that the evolution of professional work from a craft performed by human experts to a commoditised product or service available online is a function of market forces, technological advances and human ingenuity.

ROSS Intelligence, an AI platform, developed in the United States (US), is an example of innovation⁶ driving digital disruption. The digital platform is designed to understand natural language questions,

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¹ The term "disruption" is used to describe the situation arising from the use of technologies that fundamentally challenge and ultimately change traditional working practices. See Clayton Christensen, *The Innovator's Dilemma* (Harvard Business School Press, 1st ed, 1997); Jill Lepore, "The Disruption Machine", *New Yorker*, 23 June 2014.

² See Richard Susskind and Daniel Susskind, *The Future of the Professions: How Technology Will Transform the Work of Human Experts* (OUP, 1st ed, 2015).

³ See Susskind and Susskind, n 2, Ch 5.

⁴ This growth in AI is due to the rapid acceleration in data processing power at significantly cheaper prices.

⁵ Susskind and Susskind, n 2.

⁶ For the purposes of this article the author adopts the following meaning of innovation: "whereby alternative systems are introduced which may displace the traditional models of professional work, or provide access to practical expertise where previously it was not affordable, nor practicable to offer". See Susskind and Susskind, n 2, 109–110.

collect and collate evidence from searching vast digital databases and provide evidence-based answers to US bankruptcy issues,⁷ thereby performing an advisory role previously held by bankruptcy practitioners. Innovation is one of two ways in which technology can disrupt or transform professions. The second is through automation whereby routine manual or administrative work is streamlined to achieve efficiencies and cost savings.

This article considers how the insolvency profession is currently being, and may in the future be, impacted by AI, what measures can be adopted to benefit from such digital disruption and what progress has been made to date in adopting these measures. In measuring such progress, this article also reports the results of an online national survey of registered bankruptcy trustees and registered liquidators within Australia,⁸ conducted over July 2017 to February 2018, to investigate the risks and opportunities of technology-driven automation and innovation within insolvency.

The remainder of the article is organised as follows. Part II outlines the main impacts of AI on the insolvency profession to date and predicts future impacts. Part III provides the results of a survey undertaken of insolvency practitioners (IPs) to determine their understanding of the outlined impacts and the extent to which suggested measures have been adopted. Part IV determines how close the insolvency profession is to a digital insolvency practice and how professional bodies and regulators may assist the insolvency profession in the future. Conclusions are then drawn in Part V.

II. TRANSFORMING THE INSOLVENCY PROFESSION

Until recently, professionals may have considered themselves impervious to the impacts of AI, trusting in the belief that computers can neither think nor reason, and so cannot exercise professional judgment. Susskind and Susskind refer to this as the “AI fallacy”,⁹ and are confident in their belief that technology can transform the insolvency profession in two ways – through automation or through innovation.¹⁰

A. Automation

Usually the focus of automation is on streamlining manual or administrative activities with the objective of deriving benefits in the form of efficiencies and cost savings. Regulatory technology (or RegTech) provides an example of technology tools in accounting and law environments to reduce the costs and risks of regulatory compliance.¹¹ Today, routine professional insolvency work is already reduced to sets of standardised practices, especially around issues such as the identification of assets, the scheduling of creditors’ meetings and the updating of creditors so that such tasks can be conducted by non-professional staff with the support of appropriate processes and systems. The use of checklists, procedure manuals and standard guides accelerates processes, leading to cost savings but also to the eradication of avoidable errors and improvement in the quality of work outputs.

An example of automation recently introduced to the Australian insolvency profession is the use of technology in providing information to creditors and allowing creditors’ meetings and resolutions to occur without holding physical meetings.¹² The objective in doing so is to reduce compliance costs and

⁷ Karen Turner, “Meet ‘Ross’, the Newly Hired Legal Robot”, *The Washington Post*, 16 May 2016 <https://www.washingtonpost.com/news/innovations/wp/2016/05/16/meet-ross-the-newly-hired-legal-robot/?utm_term=.77902e43e381>.

⁸ Online surveys were emailed to 214 registered bankruptcy trustees, of which 45 provided responses, 358 registered liquidators were also surveyed of which 27 responded. The small sample size and the short timeframe of the analysis are acknowledged as limitations of this study.

⁹ Susskind and Susskind, n 2, 278–279.

¹⁰ Susskind and Susskind, n 2.

¹¹ Such regulatory technology tools include OneCheck (a mobile identity management platform); Know Your Client (KYC), which is a cloud-based tool that can quickly identify individuals and reduce manual identification procedures by 50%. See Beverley Head, “Red Tape Made Easy”, *In the Black*, April 2017, 36, 38–39.

¹² Such reforms were introduced by the *Insolvency Law Reform Act 2016* (Cth) and the related *Insolvency Practice Rules (Corporations) 2016* (Cth) and *Insolvency Practice Rules (Bankruptcy) 2016* (Cth) (the Rules). Section 75-75 of the Rules provide for participation in creditors’ meetings by electronic means, whereas s 75-35 require notice of electronic facilities for meetings to be provided.

generate cost savings.¹³ The holding of such remote meetings is still within the traditional insolvency framework, as attendees still interact face-to-face (albeit via video screen) and in real time but do so at a substantially reduced cost compared to the running of a traditional meeting where attendees are physically present.

Future automation opportunities will be provided by cloud computing and standardised business reporting (SBR).¹⁴ SBR allows business information recorded in accounting and business software to be extracted into pre-filled government reports, thereby generating significant cost savings as preparation, processing and lodgment times with the Australian Financial Security Authority (AFSA) and the Australian Securities and Investments Commission (ASIC) will be substantially reduced.¹⁵

B. Innovation

In contrast to automation, innovation is more difficult to envisage.

Assistance is needed to predict how the insolvency profession will evolve in an age of robotics and machine learning. Susskind and Susskind provide some assistance by identifying a number of common patterns or trends impacting professions generally.¹⁶ By selecting those trends or patterns which manifest the insolvency profession, it is possible to imagine what a futuristic insolvency profession may look like.

For example, new technologies transform how we communicate as well as how we accumulate, collate and analyse large amounts of data. Within insolvency the use of predictive analytics and diagnostic tools which are available online may enable businesses and individuals to detect the signs of insolvency earlier and thus seek more timely assistance. Such predictive data analysis and diagnostic information is generated when professional work becomes systemised. Systemisation occurs, for example, when data submitted or collected for the determination of taxpayers' (individual or corporate) income tax liability assessment also generates diagnostic analytics that measure the short and long-term sustainability (including solvency) of such taxpayer businesses.

With collaboration between the Australian Taxation Office (ATO), ASIC and AFSA, industry-specific databases of insolvency indicators or risk factors for small and medium-sized enterprises (SMEs) could be generated and made publicly available for a small fee. Conceptualised in the form of a "Solvency Health Check" computer app, SMEs and their stakeholders, particularly creditors, could access real-time analytics and diagnostics testing to provide timely alerts of approaching insolvency. Providing creditors and owners of SMEs with such alerts, during what may be termed the pre-insolvency time, may empower creditors and/or SME owners to seek financial assistance at an earlier time, when the chances of successful rescue or restructure of the SME are substantially higher.

Alternatively, in those circumstances where SMEs are unsuccessful in seeking out assistance, new technologies may offer a "DIY" (Do It Yourself) administration, saving time and money in circumstances where there are no questions of misconduct associated with the business' financial failure.¹⁷

III. THE FUTURE OF THE INSOLVENCY PROFESSION

Automation has already impacted the work of IPs, with insolvency paraprofessionals able to undertake routine tasks at a significantly lower cost when equipped with technology. Advancing technologies

¹³ Explanatory Memorandum, *Insolvency Law Reform Bill 2015* (Cth).

¹⁴ See Standard Business Reporting website: <<http://www.sbr.gov.au/about-sbr/what-is-sbr/how-sbr-works>>.

¹⁵ Steve Healey, *The Future Tax Professional* (The Tax Institute, 2016). Although Healey discusses SBR in the context of the ATO, the same benefits will apply to SBR documents lodged with ASIC or AFSA.

¹⁶ Susskind and Susskind, n 2. In Ch 3 the authors summarise eight broad patterns observed across professions generally, although no professions at the time of publication evidenced the entire eight.

¹⁷ Within corporate insolvency, the Australian Restructuring Insolvency and Turnaround Association has previously noted that given the lack of funding available for SME insolvencies, a reduced process option should be made available in certain circumstances. See Australian Restructuring Insolvency and Turnaround Association, *A Platform for Recovery 2014 Dealing with Corporate Financial Distress in Australia: A Discussion Paper* (2014) 21.

that enable the sharing of data and expertise at significantly reduced cost and the increasing use of machine learning may further reduce the traditional work of IPs. Rather than rely on professionals, AI may empower persons to rely on their own problem-solving abilities when guided by accessible, affordable knowledge provided online.¹⁸ In these circumstances, IPs must adopt new strategies if they are to survive the drop in demand for their services, and the pricing implications caused by AI's disruption.

Various models¹⁹ may assist in the identification of new strategies for the insolvency profession to pursue. Susskind and Susskind offer a model of the evolution and delivery of professional work carried out by human experts, which they break down into four main stages. Commencing with professional work as being a craft performed by craft persons on a bespoke basis (*craft*), the authors argue that through standardisation of routine professional work (*automation*) and the systemisation of information sources (*innovation*), much professional practice and expertise will be made available online (*externalisation*) either at no-charge or for a fee.²⁰ Applying Susskind and Susskind's four-stage model to the insolvency profession will result in the "evolutionary commoditization"²¹ of insolvency professional work, whereby the practical expertise of IPs is made available to non-specialists on an online basis²² in a variety of ways²³ that may or may not resemble the traditional means of producing and distributing professional expertise.

The three horizons framework provides an alternative means of identifying strategies to address the changes caused by AI. The authors' framework requires a focus on short-term growth, but at the same time opportunities should be identified and new, more effective approaches and technologies that emerge should be embraced. In the context of an insolvency practice, under this framework the first horizon is the insolvency profession's current core business, which may be considered as rescue or bankruptcy/liquidation of both individuals and corporate entities. The second horizon includes the emerging opportunities where AI may be applied within the existing state.²⁴ The third and final horizon is the long-term vision for the application of AI to enable the ongoing solvency of individuals and corporate entities to be better managed with the assistance of what may be futuristically termed (in)solvency practitioners.²⁵

The future outlook for insolvency practices will depend to a large extent upon the nature of insolvency tasks undertaken by each practice. Where a practice specialises in high volumes of routine compliance tasks then automation of these tasks will be essential to lower costs and remain competitive. However, where a practice focuses on complex, bespoke investigative or consultative work then more innovative technologies that assist in the completion of this work will be required.

Initially not all insolvency professionals will be motivated to adopt such models or strategies as they may be deeply entrenched in the traditions of their professions so that they cannot conceive that their practical expertise might be made available in a different manner and format. However, it is considered that even the most ardent sceptic of AI's impact will eventually adopt technologies that create cost savings and improve the quality and affordability of professional work so as to remain competitive and survive professionally.

¹⁸ Susskind and Susskind, n 2, 197.

¹⁹ As well as Susskind and Susskind's model, there is "The Three Horizons" framework, initially developed by Baghai, Coley and White. See Mehrdad Baghai, Steve Coley and David White, *The Alchemy of Growth: Practical Insights for Building the Enduring Enterprise* (Orion Publishing, 1st ed, 1999).

²⁰ Susskind and Susskind, n 2, 197.

²¹ Susskind and Susskind, n 2, 195–202.

²² Susskind and Susskind, n 2, 197 suggest there are three ways in which professional expertise is made available online: on the basis of "charge online"; "no-charge online"; or on a "commons basis", meaning open free access.

²³ Susskind and Susskind, n 2, 216 identify six strategies for the production and distribution of practical expertise.

²⁴ See the earlier discussion under Part II(A) of this article.

²⁵ See the earlier discussion under Part II(B) of this article.

IV. AI AND THE INSOLVENCY PROFESSION: THE CURRENT STATUS

To determine the current impact of AI on the insolvency profession, an online survey of registered bankruptcy trustees and registered liquidators within Australia was conducted between July 2017 and February 2018.²⁶ The survey sought to investigate the risks and opportunities of technology-driven automation and innovation within insolvency by answering the following two research questions:

- RQ1: Has the use of technology within insolvency practices decreased or increased the cost of external administrations?
- RQ2: Are there further technology applications which may assist IPs or creditors during the insolvency process?

A. Survey Methodology

An explanatory mixed methods design²⁷ was used to address each research question. The first research question seeks to measure the effect of automation on insolvency administration costs, whereas the second research question seeks to measure the amount of technology-driven innovation occurring within the insolvency profession. Although the quantitative data collected provides a snapshot view of the insolvency profession as perceived by its practitioners, the qualitative data provided is greatly valued as it provides further details of the technologies currently being used by practitioners with or without success. Using qualitative research to rigorously expand and explain the quantitative survey results is consistent with this type of mixed methods design.²⁸

A survey of both registered bankruptcy trustees²⁹ and registered liquidators³⁰ was conducted as being representative of the views and perspectives of IPs. Two hundred and fourteen registered bankruptcy trustees were emailed online surveys in July 2017. Of those surveyed 45 provided responses.³¹ Taking into account those individuals who held dual registrations, a further 358 registered liquidators were surveyed in February 2018. Of those a further 27 responded, making a total of 72 survey responses received.³² The small sample size for the online survey and the short timeframe of the current analysis are acknowledged as the primary limitations of this study. However, the sample while small is representative of a cross-section of small, medium and large insolvency practices undertaking both personal and corporate insolvency administrations. Future longitudinal research to be conducted by the author with the purpose of tracking and measuring the ongoing impact of AI on individual and corporate insolvency administrations will address the current study's shortcomings.

The survey document is divided into three sections. Section 1, which consists of four questions, provides contextual information of the IPs who were surveyed, including the nature of their insolvency work. Section 2 comprises 11 questions that seek to measure the reduction (if any) in external administration costs and decrease in compliance times (if any) from the current use of technology. Section 3 comprises 13 open-ended questions that seek to determine the impact of digital disruption on existing insolvency practices, including various risks and opportunities that could be mitigated and exploited respectively. A copy of the survey instrument is contained in the Appendix. University ethics approval was obtained for the online survey instrument. Survey participants were contacted via email and asked if they were willing to voluntarily participate in the survey. An information sheet that contained details of the research project, in particular its purpose, how the data is collected, stored and used, the name of a contact person

²⁶ An email containing the survey link was sent to 214 registered trustees and 358 registered liquidators.

²⁷ John W Creswell, *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research* (Pearson Education, 4th ed, 2012).

²⁸ Creswell, n 27, 566.

²⁹ Registered trustees in bankruptcy administer personal insolvencies of individuals under the *Bankruptcy Act 1966* (Cth).

³⁰ Registered liquidators administer company insolvencies under the *Corporations Act 2001* (Cth).

³¹ Response rate from registered trustees was 21.03%.

³² Overall response rate for the survey was 13.11%.

in case of inquiries, and implicit consent to use the data by completing the survey was included in the email.

B. Discussion of Results

Discussion of the survey results is similarly separated into three sections. Section 1 answers the first research question by providing a summary of IPs' perceptions of the current use of technology in their practice and its ability to lower administration costs and create efficiencies. To answer the second research question, Section 2 provides a review of IPs' views of how they will take advantage of the opportunities which AI presents within their practices. Section 3 concludes with a commentary regarding the insolvency profession's readiness to embrace these changes as well as what support is needed in the future.

A demographical snapshot of those surveyed provides the following picture of Australia's IPs, who are predominantly male,³³ the majority of whom have worked in the insolvency profession for 20–35 years³⁴ in either a small one or two partner practice³⁵ or a large practice of greater than 11 partners³⁶ where the workload is most likely distributed as 30% personal insolvency and 70% corporate insolvency.

1. The Ability of Current Technology Use to Lower Administration Costs and Create Efficiencies

A key objective of the *Insolvency Law Reform Act 2016* (Cth) and the accompanying *Insolvency Practice Rules* (Cth) is its use of technology in communicating with creditors and conducting creditors' meetings to enhance communication and transparency between stakeholders and remove unnecessary external administration costs.³⁷ However, there is a potential risk that external administration costs will increase rather than decrease initially, if not in the long term, due to the additional hardware and software needed, as well as the employment of supporting staff to provide the necessary infrastructure to support such technology. Thus survey questions 11 and 12 asked those practitioners who had held electronic meetings for creditors, whether doing so had reduced printing and postage costs.

Interestingly not all IPs surveyed held electronic meetings of creditors. Of those surveyed, 45% had not held an electronic meeting of creditors. Of those remaining IPs who had held electronic meetings, most had only done so within the last three years.³⁸ The most popular reason given by IPs for not holding electronic meetings was the perception that creditors do not attend such meetings.³⁹ Other possible reasons for not holding electronic meetings which are canvassed on the survey document, such as prohibitive cost or perceived risk of disengaging creditors, were rejected.⁴⁰ Such answers are consistent with anecdotal evidence from IPs that a "proposal without a meeting",⁴¹ an alternative means of communicating with creditors available under the *Bankruptcy Act 1966* (Cth) since May 2003⁴² and only recently introduced as a reform in corporate external administrations,⁴³ is a more cost-effective

³³ Of the 72 IPs surveyed 83% were male.

³⁴ The most popular "years of practitioner experience" bracket was 20–25 years (23.61%), followed closely by 25–30 years (16.67%) and 30–35 years (15.28%).

³⁵ Representing 31.9% of all IPs surveyed.

³⁶ Representing 29.2% of all IPs surveyed.

³⁷ Explanatory Statement to *Insolvency Practice Rules (Corporations) 2016* (Cth) and *Insolvency Practice Rules (Bankruptcy) 2016* (Cth).

³⁸ Of those IPs surveyed who had held electronic meetings of creditors: 24% had done so for 1–3 years; 17% for 4–7 years; 8% for 6–10 years; and 6% for greater than 10 years.

³⁹ 38.5% of IPs either agree or strongly agree that creditors do not attend electronic meetings.

⁴⁰ More than 50% of the survey participants who had not held electronic meetings of creditors consistently ranked these reasons as either "not applicable" or "disagree".

⁴¹ *Insolvency Practice Schedules (Corporations)* s 75-40(5)(a), (b); *Insolvency Practice Rules (Corporations) 2016* s 75-130.

⁴² Section 64ZBA (1) (2) *Bankruptcy Act 1966* authorises a trustee in bankruptcy to put a single proposal to creditors without a meeting being held.

⁴³ See Section 75–130 *Insolvency Practice Rules (Corporations) 2016*.

alternative to holding a meeting, electronic or otherwise. However, until amendments are made to the definition of “resolution” in the *Corporations Act 2001* (Cth) it would appear that external administrators are restricted to using a “proposal without a meeting” only in relation to remuneration approvals in administrations commencing on or after 1 September 2017.⁴⁴

Q11 For how many years has your insolvency practice held electronic meetings for creditors?

No of Years	Nil	1–3	4–7	6–10	Over 10
% Surveyed	45	24	17	8	6

IPs who had held electronic meetings of creditors were unable to clearly affirm that using technology in communicating with creditors through electronic meetings created cost savings. Only 50% of those practitioners who had held electronic meetings strongly agreed or agreed that doing so reduced printing and postage costs, whereas the remaining 39.1% either strongly disagreed or disagreed with 10.9% undecided. This failure to achieve cost savings may arise from creditors receiving paper-based documentation until they choose to opt in to electronic communication and has led to the suggestion that electronic communication should be offered as the default position.

Q12A Please indicate the extent to which you agree or disagree with the statement: Holding electronic meetings has reduced printing and postage costs in your insolvency practice.

Responses	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	Not Applicable
% Surveyed	21.7	17.4	10.9	45.7	4.3	0

However, survey participants did identify a trend of increasing costs of maintaining a paper-based file, in comparison with decreasing costs of a desktop paper-less file when measured over the last 10 years.⁴⁵ This trend was particularly significant in terms of the costs of maintaining client files within the larger insolvency firms. Larger firms are more likely to agree that electronic meetings have reduced printing and postage costs, as by reason of their size and administering a larger client database they are more likely to enjoy the economies of technology on a larger scale.

Survey participants strongly supported AFSA’s online delivery of personal insolvency services as instrumental in decreasing compliance times and administration costs over the last 10 years.⁴⁶ There was not the same level of support for ASIC’s online delivery of corporate insolvency services, which may reflect the smaller range of online services provided by ASIC to IPs.⁴⁷

Given the potential cost savings from the provision of online services, IPs were asked if they perceived creditors would expect higher rates of returns on their dividends. The majority of IPs responded “No”. Their justification, that higher compliance costs, including ASIC’s user-pays model, and technology costs would keep creditors’ dividend rates of return low. Only a minority of IPs answered “Yes” to creditors expecting higher returns. Some justified their view by stating that “creditors always have a higher expectation of rates of return, which may be unrealistic”. Other IPs who answered “Yes” considered that technology use would reduce investigations, recovery and administration costs leading to higher returns to creditors, and possibly creditors would also expect quicker returns (of dividends) as well.

Q20 Will creditors have expectations of higher returns given the increased use of technology by the insolvency practice?

Response	Yes	No	Not previously considered
% Surveyed	21.7	55.1	23.2

⁴⁴ See Australian Restructuring Insolvency and Turnaround Association, *Consolidated List of Outstanding Issues and Errors in ILRA-related Legislation* <<https://www.arita.com.au/>>.

⁴⁵ Question 14 on the survey document, see Appendix.

⁴⁶ Question 5 on the survey document, see Appendix.

⁴⁷ Question 6 on the survey document, see Appendix.

It may be too early to draw conclusions that electronic creditor meetings have not resulted in cost savings. Certainly proposals without meetings may prove more popular in corporate external administrations as they have done so in bankruptcies. The cost-saving trends identified in offering personal insolvency services online is good news, particularly given the potential opportunities flagged above around online services to be provided by IPs in the form of a solvency health check or DIY liquidation. However, whether these cost savings will result in higher returns to creditors appears doubtful.

2. Exploiting AI's Opportunities Within the Insolvency Profession

The majority of surveyed IPs appeared unprepared to investigate or exploit the opportunities that AI may present, believing that there is no need to do so or, alternatively, they are unaware of such opportunities. When asked whether they looked to the experience of other professions or industries for guidance in dealing with digital disruption,⁴⁸ the following responses were recorded.

Response	Yes	No	Not previously considered this issue
% Surveyed	40.6	36.2	23.2

For IPs who responded “No”, the most popular reason provided was that they did not consider there was a need to look to other industries or professions given “we (*insolvency profession*) do not have any significant disruptive events” or “are not as impacted as other professions”.

Those IPs who responded in the affirmative provided examples of automation, rather than innovation, such as using an online portal to convey information to insolvency stakeholders or providing creditors with the ability to download notices and reports from the IP’s website. One practitioner considered that the ability to innovate by providing simple English reporting and short-form reporting was restricted by existing insolvency regulation. In contrast, other IPs considered that regulation should be the driver of innovation, providing the example that efficiency in creditor communication was dependent upon electronic communication with creditors being legislated as the default position, rather than an opt-in choice.

(a) Exploiting Cost and Efficiency Implications of AI

ASIC believes regulatory technology (which includes AI, data reporting and big data analysis technologies) has the potential to reduce the cost and improve the efficiency of the regulator’s product and service delivery (to IPs) with assumed consequential flow-on effects to insolvency practices.⁴⁹ Survey participants were asked whether they had considered how these changes would impact their insolvency practice’s clients, processes and staff.⁵⁰ The following responses were provided.

Response	Yes	No	Not previously considered
% Surveyed	55	18.9	26.1

Although 55% of those surveyed thought regulatory technology would impact their practice, few IPs gave clear indications of specific changes to be implemented to manage this impact. Proposed changes included: amendment to inter-office data/information sharing to improve efficiencies and reduce costs; investigation and use of available regulatory technologies; maintenance of existing staff levels to meet increased workloads; and the pursuit of commercial recoveries.

It may well be a matter of “early days” as IP survey answers also included “still considering my options”; “saw no material change over next 5 years”; “would be no cost savings as costs and savings would balance out”. Two positive, but not popular perceptions were: “regulatory technology may provide better access to information such that insolvency practitioners can pursue claims for the benefit of creditors”, or “regulatory technology would have a positive impact by improving access to data/information at a

⁴⁸ Question 21 in the survey document, see Appendix.

⁴⁹ Australian Securities and Investments Commission, *ASIC’s Innovation Hub and Our Approach to Regulatory Technology*, Report No 523 (May 2017) [11], [72].

⁵⁰ Question 22 of the survey document, see Appendix.

lower cost". This latter view was, however, "conditional upon reducing regulatory red tape, eliminating non value-adding statutory requirements, amending the method to maintaining and sharing data and information across offices and adopting efficient, cost-effective communication to end users".

ASIC's belief in regulatory technology's potential to reduce costs and improve efficiency of ASIC's product and service delivery was not strongly endorsed by those surveyed. Survey respondents took the opportunity to express their concerns that "higher levels of intervention by ASIC meant further time diverted from core responsibilities to creditors"; "that ASIC technology was poorly planned and unlikely to generate meaningful efficiencies"; "that ASIC's increased compliance costs due to over regulation or the ASIC levy would eliminate any technology linked savings and the unpredictability of cost, especially for smaller practices, would have a negative impact on IPs".

In light of these results, a possible means of encouraging IPs to investigate and increase the use of technology within their insolvency practices is to appeal to their self-interest by putting forward the case of data collection and analytics as a means of creating efficiencies and lowering costs in their insolvency practices. In the case of small insolvency practices, which may have neither the time nor the resources to invest in data analytics, there will be a greater demand for accounting and practice management software to provide such analytic tools.

(b) Exploiting AI's Non-Costs Impact on Insolvency Practice Operations

The impact of AI is not limited to the costs of running an insolvency practice. Rather AI may impact areas such as client referrals, investigations, staff recruitment, and outsourcing of work. The following section seeks to determine if and how IPs are taking advantage of the opportunities that AI provides in these areas.

(i) Sources of Insolvency Work

Traditionally solicitors' and accountants' referrals have been the main source of insolvency practice work. However, when asked if new sources of work were emerging from the use of technology, IPs were equally divided.⁵¹ The following responses were received.

Response	Yes	No	Not previously considered
% Surveyed	44.4	44.4	11.2

IPs who answered "Yes" principally relied upon their practice's website or social media sites, primarily LinkedIn or Online Insights to increase their visibility online and thereby expand their referral networks. A website that provides direct points of contact and thus encourages users to directly contact staff was recommended, especially for potential new clients who are not referred by a solicitor or accountant, but prefer to conduct their own online searches. Blogs and newsletter emails with targeted messaging, such as the use of "safe harbour" options were also sent to potential referral sources. Facebook and Google advertising also featured as part of the practice's marketing. Despite these efforts to create an online presence, a number of "Yes"-voting IPs considered their presence online was secondary, compared to the traditional "word of mouth" referral base.

Certainly this view was also shared by some of the IPs who responded "No". The majority of "No" respondents shared the view that client referrals were significantly relationship based, as evidenced by the following quote: "Trust and personal referrals are the key sources of (*insolvency*) work. Professionals do not use social media to directly source work." Some IPs had engaged in marketing on Google or Facebook, but provided feedback that such advertising had not given rise to a material number of new matters.

At best, the majority of IPs (whether they voted "Yes" or "No") considered social media⁵² a marketing or promotional tool, unlikely to displace the trust felt by potential clients in their legal or accounting

⁵¹ Question 15 on the survey document, see Appendix.

⁵² From the responses provided by IPs in answering the survey question, it would appear that respondents conflated "technology" with "social media", which then narrowed their focus and the ambit of responses given. The survey question will be reworded to avoid this situation when next released.

advisers' IP referral. One respondent made the observation that "social media is still just reaching out to the same solicitors and accountants, just through other means", which would appear to reinforce this viewpoint.

(ii) Conducting Investigations

Overwhelmingly, surveyed IPs agreed that technology had altered how they conducted investigations resulting in positive outcomes. Survey results are outlined below.⁵³

Response	Yes	No	Not previously considered
% Surveyed	79.2	15.3	5.5

The IPs surveyed considered there were a number of benefits of using technology to conduct investigations: faster access to a wider source of information; more efficient use of time and resources when investigating; and the ability to collect and analyse data, as evidenced below. Web-based accounting software such as Xero and MYOB online provided ready access to client's financial records, without the IP having to leave their office, saving time and investigation costs. Electronic data held by third-party providers also allowed for faster, cheaper and more accurate statistical analysis, including the generation of data analytics and metrics, and efficient record-keeping. Investigative software, such as interrogation software, also saved time and investigation costs. Using such software in conjunction with electronic spreadsheets and electronic checklists ensured efficiency and reduced the reliance on paper files. Social media, such as Facebook and Google, provided search tools for locating bankrupts, company directors and asset or business locations.

However, IPs did identify certain disadvantages to using technology to conduct investigations. There is a perceived need for technology-savvy staff, and a perception that the quality of data provided has decreased, rather than increased, although this may reflect an inability to analyse the data provided rather than the quality of the data provided. There may be issues arising from the use of cloud-based accounting systems where, for example, a loss of data has enabled directors to avoid prosecution of voidable transactions, or if the data is housed offshore there may be no means to ensure available access if it is denied. Lastly, individuals or corporate entities under financial distress may not maintain electronic accounting records or any form of accounting records.

Despite these acknowledged disadvantages the majority of technology applications used by the IPs surveyed save time and investigation costs as they automate what the IP previously had to perform manually as part of their investigations. At this stage, however, there does not appear to be innovative technologies being applied by IPs when investigating insolvencies.

(iii) Staff Recruitment

The need for insolvency practices to employ technology-savvy staff has been discussed above.⁵⁴ Despite this need, survey results revealed that a majority of IPs have not altered their staff recruitment requirements.⁵⁵ Results are displayed below.

Response	Yes	No	Not previously considered
% Surveyed	38.9	57	4.1

IPs provided the following reasons for not altering their staff recruitment requirements: the size of their practices did not warrant in-house expertise; an inconsistent need for IT service requirements meant such requirements were met by outsourcing; there was a perception that current accounting/law graduates were proficient in IT; or there was a greater emphasis placed upon the accounting knowledge of staff.

Where IPs did identify a change of staff recruitment requirements, they employed specific internal IT staff to develop software and procedures for their firm, obtained the same IT skills from external

⁵³ Question 16 on survey document, see Appendix.

⁵⁴ See the discussion under Part IV(B)(2)(b)(ii) of this article.

⁵⁵ Question 17 on the survey document, see Appendix.

providers, or employed staff with knowledge of social media and digitised communication. Given the examples provided in the survey responses, it would appear that where there had been a change of staff recruitment policy the focus remained on hiring accountants/solicitors with IT-based skills rather than hiring IT staff per se, which may also be reflective of the level of technology being used in the insolvency firm.

(iv) Outsourcing of IP Work

The majority of IPs surveyed considered that technology had not increased the outsourcing of insolvency practice work. Survey results are disclosed below.⁵⁶

Response	Yes	No	Not previously considered
% Surveyed	26.4	70.8	2.8

IPs provided a variety of reasons for not outsourcing their insolvency files: “the need to retain control over times cost charging for the purposes of remuneration”; “maintenance of client confidentiality”; and “a perception that a Trustee must not outsource work that a Trustee or his staff can or should undertake”.

Particular tasks which were outsourced were a mixture of mundane, menial tasks such as “book-keeping; creditor management on large files”; “printing and distribution of bulk communication with creditors”; and “creditor meeting procedure processes, as well as more complex complicated matters such as interrogation of computer files, and forensic IT”.

V. THE DIGITAL INSOLVENCY PRACTICE

Relying upon the survey results discussed above, it would appear that a fully operational digital insolvency practice is still some time in the future. Smaller insolvency practices⁵⁷ continue to consist of single IPs or a team of permanently employed IPs, predominantly working from physical offices and relying upon word of mouth and traditional media channels to attract clients, whereas larger insolvency practices may permanently employ multidisciplinary teams of IPs and non-IP staff. Small and large practices are to a large extent divided, either using simple software and on-site servers or utilising advanced automation, communication and AI. Information in large practices is shared through online client portals, macro blogs, webs and mobile apps, whereas the smaller insolvency practices rely upon phone, email, post and fax for their communication and information-sharing purposes. Despite these differences the majority of large and small practices continue to price their services based upon time-billing or a simple fixed fee rather than value pricing, demand-based or capped pricing.⁵⁸ Marketing using online content, social media and digital advertising is generally restricted to large practices.⁵⁹

Given the current status of digitisation within insolvency practices, how can government agencies and insolvency professional bodies support IPs in developing their digital practices in the future?

Professional bodies such as the Australian Restructuring Insolvency and Turnaround Association, CPA Australia and CA Australia and New Zealand must continue to focus on building understanding of the practical use of AI in insolvency practices, especially in those smaller practices that may lack the necessary resources to undertake their own investigative research and/or training. Evidence of the need for further training can be found by considering the following. Within each of the nine open-ended questions asked in Section 3 of the survey,⁶⁰ respondents were provided with the option to answer “Have not previously considered this”. Significantly, in answering Questions 20–22, more than 23% of respondents

⁵⁶ Question 19 on the survey document, see Appendix.

⁵⁷ Smaller insolvency practices are defined as those practices with one or two registered liquidators and/or registered trustees.

⁵⁸ In regard to Q26 Statement 13, 50% of IPs surveyed “strongly disagreed” or “disagreed” that pricing of insolvency service is based on value pricing. Whereas in responding to Q26 Statement 14, 77% of IPs surveyed “agreed” or “strongly agreed” the pricing of insolvency services is based on time-billing or simple fixed fee.

⁵⁹ Larger practices are defined as those practices with greater than six or more registered liquidators and/or registered trustees.

⁶⁰ Section 3 sought IPs’ views on the impact of digital disruption on their insolvency practices.

selected this option and there was only one of the nine questions where no survey respondents selected this option.

Tertiary educators and training providers may also provide IPs with an understanding of the specific applications of machine learning technologies. By forming collaborations between the professional bodies, educators, regulators ASIC and AFSA, computer system analysts and software providers, AI learning and capabilities of IPs will be significantly improved and acted upon. Collaboration also provides broader opportunities for innovation to exploit AI's capabilities within insolvency practices and develop new ideas of adding value to clients, both pre- and post-insolvency.

VI. CONCLUSION

The insolvency profession is not immune to the digital disruption caused by technological change. AI brings opportunities to lower costs, improve efficiency and provide additional services as an IP. To determine the extent to which the insolvency profession is currently being, and may in the future be, impacted by AI a national survey of 572 IPs was conducted. Seventy-two survey recipients responded. The small sample size is acknowledged as a limitation of the study. However, the sample is representative of a cross-section of small, medium and large insolvency practices undertaking both personal and corporate insolvency administrations and provides unique insights into the views of some members of the profession on a topical issue. Their responses indicate that progress towards a digital insolvency practice has to date been slow. To accelerate progress, further education of IPs regarding the opportunities proffered by AI is needed.

Although individual insolvency practices will be motivated to innovate using technology to address their specific needs, there is a need for broader innovation. To advance the digital insolvency practice, key stakeholders within and outside of the insolvency profession must collaborate. Working together, educators, professional bodies, regulators, software providers and system analysts can empower IPs to use technology to automate their compliance-based activities, thereby saving time and costs. Further collaboration between these stakeholders and IPs may generate innovations providing IPs with access to timely, accurate and cheaper data to support their decision-making for the benefit of both creditors and debtors alike.

APPENDIX

Insolvency Profession and Technology Survey Griffith University Ethics Reference No 2017/724

INFORMATION SHEET and CONSENT FORM

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This project seeks to investigate the risks and opportunities of technology-driven innovation within insolvency by answering three research questions:

- Has the use of technology within small to medium insolvency practices decreased or increased the cost of external administrations?
- Are there further technology applications which may assist insolvency practitioners or creditors during the insolvency process?
- Has the use of technology impacted creditor engagement in external administrations negatively, positively, or not at all?

To that end, this survey seeks the views of insolvency practitioners on their existing use of technology including the recent changes introduced by the *Insolvency Law Reform Act 2016* (Cth) (ILRA) and

associated *Insolvency Practice Rules* as well as any further opportunities to generate efficiencies in insolvency practice that technology may generate.

This survey also seeks insolvency practitioner perceptions on creditors' participation and engagement with technology in personal and corporate insolvencies.

The survey should take no longer than 10 minutes to complete. There are no foreseeable risks involved in participating in this survey. All responses will remain anonymous.

It is proposed that data collection will occur from 1/10/2017 to 01/10/2020. The data collected from this research will be reported in general terms and will not involve any identifying feature. All data will be kept confidential and no participant contact details will be collated. All data will be stored securely on Griffith University servers or in a locked filing cupboard for a period of five years before being destroyed.

Research results will be reported via an academic journal and presentation. If you have any questions the researchers would be happy to hear from you. Please contact Dr Jenny Dickfos via email at j.dickfos@griffith.edu.au.

Participants of the survey can obtain access to the summary of the results, by contacting Dr Jenny Dickfos via email at j.dickfos@griffith.edu.au.

Griffith University conducts research in accordance with the National Statement on Ethical Conduct in Human Research. If potential participants have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on 37354375 or research-ethics@griffith.edu.au.

By completing this questionnaire you indicate your agreement and consent to participate in this research. While you are completing the survey you can change your mind and withdraw your consent to participate. However, once the survey is submitted, you will not be able to withdraw your consent.

Thank you very much for supporting this research.

Section 1 Insolvency Practitioners Demographic Information

S1. The following questions seek to provide contextual information of the insolvency practitioners being surveyed, including the nature of their insolvency work which is relevant to the answers provided in Sections 2 and 3 of this survey.

Q1 Please indicate your Gender

1. Male
2. Female
3. Other

Q2 How many years have you practised as an Insolvency Practitioner?

1. <5 years
2. 5–10 years
3. 10–15 years
4. 15–20 years
5. 20–25 years
6. 25–30 years
7. 30–35 years
8. 35–40 years
9. 40–45 years
10. 45–50 years
11. >50 years

Q3 How many Registered Liquidators or Registered Trustees in your Insolvency Practice?

1. 1–2
2. 3–5
3. 6–10
4. 11 or more

Q4 Indicate the percentage of Personal Insolvency vs Corporate Insolvency work carried out in your Insolvency Practice?

1. Nil/100
2. 10/90
3. 20/80
4. 30/70
5. 40/60
6. 50/50
7. 60/40
8. 70/30
9. 80/20
10. 90/10
11. 100/Nil

Section 2 Current Technology Use in the Insolvency Practice

S2. A key objective of the *Insolvency Law Reform Act 2016*'s use of technology in communicating with creditors and conducting creditors' meetings is to enhance communication and transparency between stakeholders and remove unnecessary external administration costs. However, there is a risk that external administration costs will increase rather than decrease initially, if not in the long term, due to the additional hardware and software purchases as well as the employment of supporting staff to provide the necessary infrastructure to support such technology.

S3. The following questions seek to measure the reduction (if any) in external administration costs and decrease in compliance times (if any) from the use of technology, as well as assess any perceived creditor disengagement from such technology use.

Q5 Please indicate to what extent the Australian Financial Security Authority's (AFSA) online delivery of personal insolvency services has decreased compliance times and administration costs over the last ten years?

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	NA
1. Bankruptcy Register Search						
2. Practitioner AER Online						
3. Debt Agreements Online						
4. Official Receiver Notices Online						
5. E-Inspections						
6. Creditor bankruptcy notices						
7. Practitioner resources webpage						
8. Business to Government system (B2G)						
9. Professional Development materials and precedents						

Q6 Please indicate to what extent ASIC's online delivery of corporate insolvency services has decreased compliance times and external administration costs over the last ten years?

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	N/A
Registered Liquidator Portal						
ASIC published notices website						
ASIC Company Searches						

Q7 Does your insolvency practice use cloud software? Yes No

If you answered "Yes" to Q7 proceed to Q8 and Q9 otherwise proceed to Q10.

Q8 Does your practice offer data connectivity to provide automatic data entry from client software and pre-populate client files and workpapers? Yes No

Q9 Do you agree or disagree that the use of cloud software is a significant cost of the insolvency administration?

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	N/A

Q10 To what extent do each of the following statements explain why your insolvency practice does not use cloud software?

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	N/A
1. The cost of cloud software is prohibitive						
2. The perceived security risk is too high						
3. The cost of data security is too high						
4. Client database does not warrant cloud use						
5. Perceived risk of disengaging creditors						

Q11 For how many years has your insolvency practice held electronic meetings for creditors?

1. Nil
2. 1–3
3. 4–7
4. 6–10
5. over 10 years

If you answered "Nil" to Q11 proceed to Q14 or otherwise proceed to Q12 and Q13

Q12 Please indicate the extent to which you agree or disagree with each statement:

Q12.A Holding electronic meetings has *reduced* printing and postage costs in your insolvency practice.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	NA

Q12.B Holding electronic meetings has *increased* creditor engagement and attendance.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	N/A

Q13 Please indicate to what extent each of the following statements explains why your insolvency practice does not hold electronic meetings for creditors.

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	N/A
1. The cost is prohibitive						
2. The perceived risk is too high						
3. The cost of data security is too high						
4. Creditors do not use						
5. Perceived risk of disengaging creditors						

Q14 Please indicate to what extent each of the following statements explains the trends in the cost of maintaining a paper-based file compared to a desktop paper-less file in your insolvency practice over the last ten years.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	N/A

1. Increasing costs of a paper-based file; decreasing costs of a desktop paper-less file
2. Decreasing costs of a paper-based file; increasing costs of a desktop paper-less file
3. Decreasing costs of a paper-based file; decreasing costs of a desktop paper-less file
4. Increasing costs of a paper-based file; increasing costs of a desktop paper-less file
5. No change in costs of paper-based file; no change in costs of a desktop paper-less file
6. No change in costs of a paper-based file; increasing costs of a desktop paper-less file
7. Increasing costs of a paper-based file; no change in costs of a desktop paper-less file
8. No change in costs of a paper-based file; decreasing costs of a desktop paper-less file
9. Decreasing costs of a paper-based file; No change in costs of a desktop paper-less file

Section 3 Technology and the Future of the Insolvency Profession

S4. Digital Disruption may be impacting your insolvency practice in the areas of client referrals, investigations, data collection and analysis, staff recruitment and engagement, outsourcing of work and creditors expectations of returns.

The following open ended questions seek to determine the impact of digital disruption on insolvency practices, including various risks and opportunities and how insolvency practitioners will take advantage of such opportunities and seek to mitigate any risks.

Q15 Solicitors & Accountants traditionally have been the main source of Insolvency Practice work. Are new sources of work emerging from the insolvency practice's use of technology (eg social media)?

- Yes
- Have not previously considered this
- No

[Only shown if Yes selected] If yes, how is your Insolvency practice leveraging technology to expand its referral network?

[Only shown if HNC or NO selected] Please provide us with any reasons why.

Q16 Has your Insolvency Practice's manner of conducting investigations altered by using technology (eg analysing collected data)?

- Yes
- Have not previously considered this
- No

[Only shown if Yes selected] If yes how?

[Only shown if HNC or NO selected] Please provide us with any reasons.

Q17 Has technology changed the insolvency practice's staff recruitment (eg hiring IT staff or hiring accountants with IT based skills (such as forensic qualifications)?)

- Yes
- Have not previously considered this
- No

[Only shown if Yes selected] If yes, please provide specific example/s

[Only shown if HNC or NO selected] Please provide us with any reasons why.

Q18 Has technology changed the insolvency practice's staff engagement processes?

[Only shown if Yes selected] If yes, please provide specific example/s

[Only shown if HNC or NO selected] Please provide us with any reasons why.

Q19 Has technology increased the outsourcing of insolvency practice work?

[Only shown if Yes selected] If yes, please provide specific example/s

[Only shown if HNC or NO selected] Please provide us with any reasons why.

Q20 Will creditors have expectations of higher returns given the increased use of technology used by the insolvency practice? (eg data analysis of financial information allows for earlier action to be initiated against the debtor)

- Yes
- Have not previously considered this
- No

[Only shown if Yes selected] If yes, please explain why?

[Only shown if HNC or NO selected] Please provide us with any reasons why.

Q21 Does the experience of other professions or industries and the manner in which they deal with digital disruption provide you the insolvency practitioner with ideas to improve efficiency and creditor engagement?

- Yes
- Have not previously considered this
- No

[Only shown if Yes selected] If yes, please provide specific example/s

[Only shown if HNC or NO selected] Please provide us with any reasons why.

Q22 ASIC believes regulatory technology (which includes artificial intelligence, data reporting, and big data analysis technologies) has the potential to reduce the cost and improve the efficiency of product and service delivery.⁶¹ Have you considered how these changes could impact your insolvency practice's clients, processes and staff?

- Yes
- Have not previously considered this
- No

[Only shown if Yes selected] If yes, please describe how and how you propose to manage such change.

[Only shown if HNC or NO selected] Please provide us with any reasons why.

S5. Data can be used to create efficiencies within Insolvency Practices by helping to prioritise work and re-design processes. Technology use can lead to automated practices or innovation, which in turn can lead to more competitive practices.

⁶¹ Australian Securities and Investments Commission, n 49.

Q23 Does your Insolvency practice collect and analyse its operations’ costs and revenues to determine how to deliver insolvency services cheaper, faster and more efficiently in future?

- Yes
- Have not previously considered this
- No

[Only shown if Yes selected] Please provide a brief example of the data analysed and how it has impacted your insolvency practice.

Only shown if HNC or NO selected] Please briefly explain why you do not conduct such analysis.

Q24 Please indicate whether the insolvency work performed in your practice consists of:

1. High volume of routine tasks
2. More complex and necessarily bespoke activities
3. A mixture of both

[If 3 (mixture of both) selected, Q25 presented.

Q25 Please identify what percentage of the practice’s insolvency work is complex

1. 10%
2. 20%
3. 30%
4. 40%
5. 50%
6. 60%
7. 70%
8. 80%
9. 90%

Q26 Please indicate to what extent each of the following statements describes your insolvency practice today.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree	N/A

1. The practice consists of a number of multi-disciplinary teams of IPs and Non-IPs staff
2. The practice consists of single IPs or Teams of IPs
3. Workspaces in the practice are remote activity-based workspaces
4. Workspaces in the practice are physical offices
5. The practice’s workforce consists of sub-contracted/outsourced networks
6. The practice’s workforce consists of permanent employees
7. Technology in the practice consists of simple software, on-site servers
8. Technology in the practice consists of advanced automation, communications and AI
9. Information sharing in the practice consists of online client portals, micro-blogs web and mobile applications
10. Information sharing in the practice consists of phone, email, post and fax.
11. Improvement processes are proactive and systematic within the Insolvency practice
12. Improvement processes are conservative and ad-hoc
13. Pricing of insolvency services is based on value pricing, demand-based pricing, or capped pricing
14. Pricing of insolvency services is based on time billing or simple fixed fee
15. Marketing of insolvency services consists of online content, search, social media marketing and digital advertising
16. Marketing of insolvency services is based on word of mouth, and traditional media channels

Q27 Most IPs are qualified solicitors or accountants. However, emerging technologies will require IPs to enlarge their skill set.

Please indicate the extent to which you believe you have skills and/or knowledge in the following areas:

	No Experience	Beginner	Intermediate	Advanced	Expert	N/A
1. Software coding skills						
2. Data Analytics						
3. Digital Marketing						
4. Cyber Security						

Thank you for your participation in completing this survey.