

## IFC Technology Code of Conduct— Progression Matrix—Public Draft

**Addendum to IFC EM Compass Note 80:** *Developing Artificial Intelligence Sustainably:  
Toward a Practical Code of Conduct for Disruptive Technologies*



### Core Values

		Expected Practices for EMERGING COMPANIES	Expected Practices for LATER STAGE COMPANIES	Expected Practices for MATURE COMPANIES
<b>1. BENEFIT</b> Technology should provide customers, individuals, and communities with access to products, services, and capabilities that benefit them.	BUSINESS PROCESS	Commercially viable product providing benefits to as many customers, individuals, and communities as possible	<b>Same</b>	<b>Same</b>
		No inherent harm that cannot be sufficiently minimized, mitigated, or responsibly accepted in the context of the industry and relevant social norms	Clearly articulated purpose of using the technology for the benefit of individuals, communities, and the environment; and not causing harm to individuals, communities, or the environment. All potential benefits and risks, with relevant mitigants, clearly documented	<b>Full Well-Being Impact Assessment</b> (for example, based on the Maslow Hierarchy of Needs) developed, with regular updates
	TECHNICAL ASPECTS	Product performs intended function consistently and correctly	<b>Same</b> , and guards against immediate negative side effects of technology incorporated into product design	Product design addresses potential indirect and negative longer-term impact of adoption
			Feedback about user experience incorporated into product design to increase benefit provided by product	Product continually updated to maximize benefit based on user experience and feedback

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		Expected Practices for EMERGING COMPANIES	Expected Practices for LATER STAGE COMPANIES	Expected Practices for MATURE COMPANIES
<b>2. INCLUSIVENESS</b>  Technology should be designed and developed in a manner that ensures outcomes reflecting the requirements and values of individuals and communities expected to use or benefit from the technology.	BUSINESS PROCESS	Consultations with users and beneficiaries inform product design	Regular and formalized consultations to assure outcomes consistent with community and consumer expectations, and their systematic integration into product design	<b>Best-practice stakeholder engagement</b> , including with specifically affected communities
		Diversity of technical and business staff involved in product design, and of management and governance functions	<b>Same</b> , and specialized forms of consultation with vulnerable categories (children, individuals with disabilities, elders without IT literacy, etc.)	<b>Same</b>
	TECHNICAL ASPECTS	Product fulfills a need identified by user base	<b>Same</b> , and feedback about user experience (UX Design) incorporated to increase benefit provided by product	<b>Same</b> , and transparent use of appropriate, real-time feedback mechanism; appropriate AB testing to maximize usability
		Product can be used by all members of the intended user base	<b>Same</b> , and product enables access to individuals and groups with disabilities or similar access challenges	<b>Same</b> , and product is customized to maximize usability given a specific user profile, such as accommodating language spoken
		Datasets used are representative of most intended users and use cases	Underlying dataset is largely representative of the world the product will operate in	Underlying dataset is representative of the world the product will operate in; updated continually as new user profiles/edge cases are identified

<b>3. FAIRNESS</b>  Technology should be designed, developed and used in a fair and non-discriminatory manner. Technology providers should avoid anti-competitive or unfair commercial practices that unreasonably impede technology access and adoption.	BUSINESS PROCESS	Potential discriminatory impact of the technology on various individuals, groups, and communities identified, mitigated, and disclosed	<b>Same</b> , and the identified impacts, mitigations, and disclosures clearly documented and regularly reviewed with all product iterations and in response to new information	<b>Full Bias Impact Statement</b> developed
			Governance body tasked with proactive risk assessment of emerging public and policy concerns and fairness considerations, including in relation to use of personal data and tax impact on markets	<b>Same</b> , and responsible tax practices consistent with relevant international best practice such as OECD, BEPS etc.
				Proactive <b>fairness and reputational risk assessment</b> integrated into robust compliance function
	TECHNICAL ASPECTS	Product does not derive insights or knowledge from protected classes, including indigenous or historically disadvantaged communities, without their knowledge or compensation	<b>Same</b>	<b>Same</b>
		Product uses heterogeneous data set (for example, collecting data from a variety of reliable sources)	<b>Same</b> , and <b>industry standard toolkits</b> used to identify and address potential bias (using agreed-upon definition of fairness to determine what constitutes objectionable results)	<b>Same</b> , and mechanism for continuous bias testing and related response of incorporated into design; repeated for any updates
		Algorithmic bias risks considered in development or acquisition of tools	<b>Same</b> , and outcomes of bias testing iterated into product improvement	<b>Same</b>



## Safeguards

		Expected Practices for EMERGING COMPANIES	Expected Practices for LATER STAGE COMPANIES	Expected Practices for MATURE COMPANIES
<b>4. TRANSPARENCY</b>  Affected individuals, communities, and stakeholders should be provided with access to information sufficient to understand the risks, opportunities, and impacts of the technology.	BUSINESS PROCESS	High-level disclosures on the application of the <b>Technology Code of Conduct</b> to public—in any terms of use; and to investors—in any fundraising	<b>Same</b> , and integrated into privacy disclosure of the company	<b>Same</b> , and plain language explanation readily available to the public and as part of regular integrated reporting of the company
		Detailed periodic reporting on the application of the <b>Technology Code of Conduct</b> to governance body and investors	<b>Same</b> , and ability to explain individual decisions in a manner understandable by human expert	<b>Same</b> , and transparency by design, for example, with embedded reporting capacity and metrics
		Any material concerns relating to the <b>Technology Code of Conduct</b> are mitigated and/or escalated to management, as practical	<b>Same</b>	<b>Same</b>
	TECHNICAL ASPECTS	No algorithms used in the product are a “black box” and all underlying documentation is available for review	<b>Same</b>	<b>Same</b>
		Developers understand which factors are relevant for decision making and the general process by which those decisions are made	Developers and other experts can trace how any algorithm used makes individual decisions (for example, by using the <b>LIME package</b> )	<b>Same</b>
			External post-hoc explanation is available: observing output and reverse internal explanation; And counter-factual explanation: how specific factors influence algorithmic decisions	<b>Same</b> , and supplementary explanatory infrastructure, with immediate, easily understandable explanations of any decision making incorporated into regular use of the product, and shown to user automatically or upon request
<b>5. INFORMED CONSENT</b>  Affected individuals and communities should be provided with the right to give meaningful informed consent before using the technology.	BUSINESS PROCESS	Notify individuals that their data are collected and for what purpose, in compliance with applicable law	<b>Same</b> , and easily understandable, plain-language consent language, with examples available to users	<b>Same</b> , and intuitive and customized for the different types of users; and design Terms of Service as negotiable to consumers (with company determining “deal-breakers” or non-negotiable conditions ahead of time)
			Users have the ability to request information update and to be able to provide consent again	<b>Same</b> , and conditional and dynamic consent, with downstream consequences (positive and negative) explicitly called out; and make easily available personal data management tools

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<b>INFORMED CONSENT</b> (continued)	BUSINESS PROCESS		Data are not used to make sensitive inferences, infer traditional knowledge or practice, or make important eligibility determinations without the free prior informed consent of the individuals or communities concerned	<b>Same</b>
				Affirmative consent (on a rolling basis): initial consent based on currently available information, can be revoked at any time as information is being updated
	TECHNICAL ASPECTS	Product does not use any data obtained illegally or without consent	<b>Same</b>	<b>Same</b> , and identification technologies used to assure user control over data sharing and use preferences, including possible compensation
		Any algorithms used are not trained on datasets containing data obtained illegally or without consent	<b>Same</b>	<b>Same</b>
		If applicable, interface presents user with terms of service before use; user must agree before they are allowed to engage with product	<b>Same</b> , and terms of service are presented clearly, without any unnecessary barriers to comprehension (for example, requiring user to link to another page or zoom in on small text)	<b>Same</b> , and users are automatically re-prompted for consent when encountering a new use case or when organization plans to use their data in new ways; and any terms presented are clear, readable, and customized for maximum comprehension based on the available information on user
		If the technology involves “affective systems”: opt-in policy with explicit consent	<b>Same</b>	<b>Same</b>
		Company business plan outlines roadmap for managing data, privacy, and consent issues	Project team assesses and mitigates data, privacy, and consent issues raised by proposed product offering	Company undertakes <b>Privacy Impact Assessment</b> on project, product, service, program level; and these cover various aspects of privacy, including personal information, personal behavior, personal communications, location.
				Appropriate AB testing employed to maximize engagement/understanding of terms
				Integration of tech solution such as value-based identity management system

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<b>6. VALIDATION</b>  The claimed principles, norms, and outcomes of the technology should be validated by training and confirmation against scenarios and datasets appropriate to the envisioned purpose, risks, stakeholders, and implementation scale.	BUSINESS PROCESS	Validate algorithms on separate dataset overseen by separate data team and report the findings to management and governance body	<b>Same</b> , and periodic validation, including in response to specific concerns and emerging risks	<b>Same</b>
		Limitations and assumptions of the system, as well as data sources are fully documented	<b>Same</b> , and the following is also documented: data used to train the system, algorithms and components used; results of behavior monitoring	<b>Same</b> , and such documentation is in line with methodology approved by the Board and reviewed by independent third party
	TECHNICAL ASPECTS	Any algorithms perform within acceptable window of accuracy (as determined for the use case) and consider appropriate information when making decisions	<b>Same</b> , and in known cases where algorithm fails, developers understand why (to trace root-causes in case of caused harm)	<b>Same</b> , and product failures are extremely rare and promptly addressed when identified
		Dataset contains no known pollution	<b>Same</b> , and data provenance record in place to trace the potential data update, missing and error cause by data transformation within the organization	<b>Same</b> , and validation methodologies and outcomes audited by an independent party
			Different data sets are required for training, testing, and validation	<b>Same</b>
			Behavior is constant under constant conditions	<b>Same</b>

<b>7. SECURITY</b>  Technology should be designed, developed, and used in line with technical and organizational safeguards sufficient to assure its secure use and protect against misuse, especially in relation to personal data.	BUSINESS PROCESS	Key security vulnerabilities throughout operational lifetime of the technology (data pollution, physical infrastructure, cyber-attacks, etc.) understood and addressed	<b>Same</b> , and such understanding properly documented, including the corresponding controls	<b>Same</b> , and regularly checked/updated and integrated into comprehensive risk governance system reflecting “three lines of defense”
			Security maturity assessed in line with industry good practices (such as NIST or similar)	<b>Same</b> , and such documentation is in line with methodology approved by the Board and reviewed by independent third party
	TECHNICAL ASPECTS	Product contains no significant known security flaws	<b>Same</b> , and product designed with consideration of potential security risks	<b>Same</b> , and ISO or similar process certifications in place
			Targeted stress testing performed for high-likelihood/risk scenarios	<b>Same</b> , and comprehensive stress testing performed regularly, results implemented quickly and effectively

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<b>8. RESPONSIBILITY</b>  Technology providers and the technology developed shall comply with applicable law and should respect human rights. Technology providers should assist public authorities to understand the risks, impacts, and opportunities of the technology in order to develop effective policy and regulatory frameworks.	BUSINESS PROCESS	Compliance with applicable law (NOTE: this is cross-cutting requirement relevant for all the other principles, most notably: Transparency, Informed Consent and Accountability)	<b>Same</b>	<b>Same</b>
			Positive response to asks for engagement with the community	<b>Same</b> , and proactively engaging with stakeholders including regulators and civil society to identify and manage risks, impacts, and opportunities
	TECHNICAL ASPECTS	Product developed with safeguards to not support illegal activities	<b>Same</b> , and use of industry best practice methodology for efficiently flagging and addressing suspicious activity	<b>Same</b> , and working with other members of the ecosystem to develop industry leading detection and removal technology for objectionable content
		Escalation mechanisms, including product development checkpoints, for modifying product if found to be supporting such illegal activities	<b>Same</b>	<b>Same</b>
		Data/other evidence could be extracted from system if requested by law enforcement	<b>Same</b> , and data can be easily extracted and explained to law enforcement or the general public when requested	<b>Same</b> , and effectiveness of processes periodically audited by independent third party
				Features proactively designed to minimize misuse and toxic behavior; updated continuously in response to data on engagement

<b>9. ACCOUNTABILITY</b>  Technology providers should be accountable for the performance and foreseeable ethical implications of the technologies they develop and for managing evolving and emerging issues from continuous technology improvement. This includes ensuring that affected individuals and communities have recourse to judicial and administrative remedies, as well as to appropriate mechanisms for consultation and redress.	BUSINESS PROCESS	Company-level redress mechanism exists and does not impede access to judicial and administrative remedies	<b>Same</b> , and sophistication of redress mechanism scaled to the risks and adverse impacts and primarily focused on affected individuals and communities	<b>Same</b> , and reporting to the affected individuals and communities on the effectiveness of the redress mechanism
		Sufficiently independent function responsible for receiving and addressing concerns including escalation to management	<b>Same</b>	Fully independent function, reporting directly to Board, tasked exclusively with redress mechanism responsibilities
	TECHNICAL ASPECTS	Product team is equipped to modify product, if necessary, in response to results of redress process	<b>Same</b> , and method for submitting requests for redress is built into product	<b>Same</b> , and redress mechanism is highly intuitive, and presents clearly at the time a request would be likely
		Record of parties responsible for work on different products/features exists in case problems emerge	User can access data about their experience with product that could be relevant in a judicial or administrative remedy	<b>Same</b> , and relevant information for a redress case is clearly and easily available to user; suggestions are made for what information would be potentially relevant
			Modifications due to reported issues implemented quickly and effectively	Appropriate AB testing to maximize usability of these systems



## Building Blocks

		Expected Practices for EMERGING COMPANIES	Expected Practices for LATER STAGE COMPANIES	Expected Practices for MATURE COMPANIES
<b>10. GOVERNANCE</b>  Technology providers should maintain governance and management systems appropriate to the purpose, scale, and potential impacts of the technology to assure reasonable control over such impacts. Technology providers should seek to avoid, minimize, and mitigate potential risks and impacts, including environmental, social, governance, and privacy risks and impacts.	BUSINESS PROCESS	Governance body and investors give innovation and technical teams clear direction on the values and norms to be promoted in the technology design, reflecting the <b>Technology Code of Conduct</b>	Technology provider has developed a full <b>Risk Governance Framework</b> , reflecting the <b>Technology Code of Conduct</b> , comprising: risk identification, high-level and detailed risk assessment, risk mitigation (through policies and procedures, training and communication), monitoring, reporting, and third-party audit	<b>Same</b> , and has established governance functions with appropriate level of independence, including a second line of defense role for programmatic implementation of the Risk Governance Framework, to support staff and supply them with methodology on how to consider the principles of the Technology Code of Conduct
		Sufficient knowledge and understanding of risk issues addressed in the <b>Technology Code of Conduct</b> on all levels of the organization, from individual teams to management, governance bodies, and investors	<b>Same</b> , and Board reviews effectiveness of Risk Governance Framework at least annually.	<b>Same</b> , and Board adopts <b>maturity roadmap on key risks</b> , mapped to business plan milestones, reflecting NIST-type frameworks and disclosed in fundraising documents

The EM Compass Note 80, *Developing Artificial Intelligence Sustainably: Toward a Practical Code of Conduct for Disruptive Technologies* to which this addendum refers can be found here: [www.ifc.org/EMCompassNote80\\_TCoC](http://www.ifc.org/EMCompassNote80_TCoC).



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