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SOCIAL RESEARCH AND TRAINING
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Report

OIC Business
Intelligence Center

IsDB



مجموعة البنك الإسلامي للتنمية
Islamic Development Bank Group



The herewith Report has been reviewed by Path Solutions as a Technology Provider and Advisory Firm addressing mainly the IT architecture solutions of the OBIC.

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List of Abbreviations

AML	Anti-Money Laundering
AU	Aman Union
BI	Business Intelligence
IG	Information Governance
CAGR	Compound Annual Growth Rate
COMCEC	The Standing Committee for Economic and Commercial Cooperation of the Organization of the Islamic Cooperation
CDD	Customer Due Diligence
CRSP	Credit Reporting Service Providers
CTF	Counter-Terrorism Financing
D&B	Dun and Bradstreet
DMAI	Destination Marketing Association International
DMO	Destination Management Organization
DUNS	Data Universal Number System
DROPP	Digital Record of Payment Platform
ECAs	Export Credit Agencies
ECB	European Central Bank
EU	European Union
FATF	Financial Action Task Force
FDI	Foreign Direct Investment
FICO	Fair Isaac Corporation (Credit Rating)
GCC	Gulf Cooperation Council
G7	Group of Seven
KPIs	Key Performance Indicators
ICIEC	The Islamic Corporate for the Insurance of Investment and Export Credit
ICDT	The Islamic Centre for the Development of Trade
IFC	International Finance Corporation
IsDB	Islamic Development Bank
IsDBG	Islamic Development Bank Group
IRS	Internal Revenue Service
ITC	International Trade Center
MENA	Middle East North Africa
MCs	Members Countries
NTO	National Tourism Organization
OECD	The Organisation for Economic Co-operation and Development
OBIC	OIC Business Intelligence Center
OIC	The Organization of Islamic Cooperation
PCR	Public Credit Registry
RAM	Rating Agency Malaysia Berhad
SESRI	Statistical, Economic and Social Research and Training Centre for Islamic Countries
SWOT	Strengths, Weaknesses, Opportunities and Threats
UNWTO	The World Tourism Organization

Preamble

1. The new era of proliferation of abyssal structured data presents a great opportunity to boost economic, financial, social and environmental growth via the implementation of efficient and innovative decisions making processes.
2. The trend in the revolution Data is characterized by high volume of digitally generated data and not digitized manually which can be easily manipulated via mathematical algorithms formula. Furthermore, the passively produced or extracted data in the existing systems do offer limited automated solutions which remain mainly characterized by collection and storage data.
3. According to the Harvard Business Review "less than half of an organization's structured data is actively used in making decisions". Multilaterals and corporates alike are increasingly overwhelmed with data while expected to make effective decisions.
4. Further, it is obvious that the mass of data facing companies may create issues for those mired unaccustomed to modern technology, but we need to recognize the immense opportunity that offers for those willing to embrace the diversity, simplicity and flexibility of modern, complicated and sophisticated solutions.
5. Developments in Data Management and Analytics has enabled specific end end-users to improve productivity across all sectors as well as to shape new sectors. It has expanded the scope of industrial policies from a singular focus on manufacturing to include adjacent services industries as well as the outsourcing of operations.
6. According to the «New Digital Economy and Development" (UNCTAD, 2017), the NDE will include most prominently:
 - Advanced manufacturing, robotics and factory automation;
 - New sources of data from mobile and ubiquitous Internet connectivity;
 - Cloud computing;
 - Big data analytics; and
 - Artificial intelligence.
7. Expanding on the NDE strategic areas, The Fourth Industrial Revolution is nowadays putting the Banking and Finance sectors are the heart of the Artificial Intelligence dynamic propelled by innovative technologies solutions including Blockchain technology solutions providers.
8. Further, the credit Insurance Industry which do relies on credit bureaus, remain the primary medium for gathering and distributing reliable credit information, from collecting data across multiple sources on corporate or individuals' subjects, to consolidating and creating comprehensive credit profiles.

Rationale: How will the BI Ecosystem unlock MCs Potential?

9. MDBs and ECAs could play an important role to boost intra-OIC investment and trade flows, through providing accurate, reliable and affordable data linked to the following domains: a) Financing facility, b) Guarantee Financing, c) Credit Insurance facilities, d) Investment Insurance facility, e) Bonding facilities (these services which take a number of forms such as bid bonds, performance bonds), g) Re-insurance services: f) Advisory services, g) Training services.
10. To belong to first Tier Performer Economies in the world, it is critical to prioritize data management, analytics, and business intelligence (BI) capabilities. Fortunately, today's top enterprises management solutions enable

final users to do that by providing real-time visibility into the business and promoting collaboration across the enterprise. Such solutions are designed to deliver actionable information by endowing data, as the late business management authority.

11. For instance, an enhanced credit-reporting system at the level MCs, could be considered as a key pillar in the data value chain. Their value, however, is often overlooked or under-appreciated. Accordingly, capturing and interpreting data remain significant in facilitating financing activities needed to support a thriving economy. Further, the availability of top performing credit reporting systems in a MCs, remain one of the predominant factors to measure the country's readiness for doing business.
12. In order to enhance/create the first-class credit reporting systems, the world has witnessed the spread of BI solutions, which can embrace three following areas:
 - Descriptive analytics: Summarizes raw data and breaks it down into useful quantitative and qualitative structure;
 - Predictive analytics: Through very specific mathematical algorithms and building on historical data, predicting to predict the future with more accuracy; and
 - The last new domain called "Prescriptive Analytics" supports decisions-makers by providing multiple scenarios that lead to multiple results.
13. These new AI-powered analytics do not only predict what will happen, but also provide clear rationale for predictions. AI-powered BI systems will certainly transform business data into simple, accurate, real-time narratives and reports.
14. A competitive advantage can also be achieved once organizations directly correlate historical events with potential future events. This correlation can only be supported with the availability of organizational capabilities that can translate the organizations' informational needs and align them with respective available technology solutions
15. The enormous progression in analytics and BI tools indicates that businesses are still requiring more mature decision-making supporting tools. Recent developments in business digitization is driving the development of prescriptive analytics.
16. For example, credit insurance industry stands to benefit from the application of AI, with multifaceted mathematical algorithms/blockchain for automating data integration to reduce the time spent in underwriting complex transactions while ensuring decentralized storage of critical data.

A Global Data Cooperation: The OIC Business Intelligence Centre

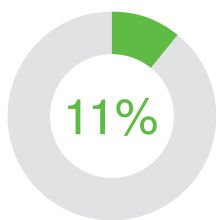
17. Given substantial challenges facing the OIC Member Countries, especially in procuring and accessing reliable, affordable business information on potential business partners, and building on the ICIEC's longstanding in-depth experience over the last 25 years in the field of credit insurance and credit information databases, the Corporation has decided to assess the feasibility of establishing a financially viable and dedicated Business Intelligence Center for the OIC that can possibly address this pressing need.
18. In doing so, ICIEC seeks to build on the successes of the Aman Union and replicate it on a larger scale to create a multilateral solution. Among other issues, the OBIC will tackle setting up the legal framework that governs the collection, treatment and sharing of business information with its primary public and private stakeholders and customers. It will also provide an architecture, including well-conceived executive dashboards, user-friendly ad-hoc capabilities, and forward-looking predictive analytics.
19. This ecosystem will enable the development of a steadfast business intelligence database/digital platform that covers cross-border credit registry and linked credit bureau services (OIC wide with potential Hub & Spoke model). It will also provide advisory services including capacity building to Member Countries across the different maturity levels to drive business/credit intelligence impact across all members.

20. The proposed OBIC could create the right linkage across core segments of the data Value Chain, connecting Data providers and potential sources, Data Subjects, Service Providers, End Users and Ecosystem Enablers. The framework connects the BI Ecosystem through the following functions, namely: Data stewardship (data quality and data integrity), IT support, BI Delivery, Data acquisition, Advanced analytics, Information Governance, and vendor contracts management.
21. A cross-OIC database credit registry and infrastructure will definitely be a hallmark of its Centers offerings, providing both the technology platform as well as credit data infrastructure that can be leveraged at country level (for those with no or very little credit infrastructure) or those ready to share and leverage cross-border credit intelligence.
22. At the large strategic scale, the OBIC role will leverage on The Fourth Industrial Revolution ongoing trajectory by putting the Banking, Finance and Credit Insurance industries at the heart of the Artificial Intelligence dynamic propelled by innovative technologies solutions including Blockchain technology solutions providers.
23. In advancing the setting up of the OBIC, the 34th COMCEC Ministerial Meeting (29 November 2018) and under the Leadership of the President of IDB Group, HE Dr. Bandar Hajjar, has adopted a Ministerial Resolution requesting ICIEC in collaboration with IsDB Group and SESRIC to jointly partner and submit the herewith OBIC Report aiming at the operationalization of the OBIC¹.
24. Under the strategic guidance of IsDB, ICIEC and SESRIC will ensure the monitoring of the establishment of a best-in-class business intelligence ecosystem development able to serve all OIC MCs (regulatory guidelines, data collection, security, consumer/creditor rights, cross border data flow frameworks, PPP, Industry Association, other).
25. With an eye on the future, a subsequent goal is to explore the possibility of establishing an independent Rating Agency under the aegis of the Organization of Islamic Cooperation (OIC), so to assess the creditworthiness of public and private corporations as well as governments, in meeting their obligations (e.g. debt securities issued by governments and companies).

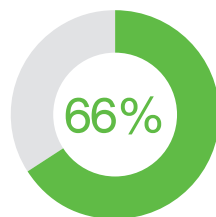
1 <http://www.comcec.org/en/comcec/about-comcec/comcec-sessions/34th-ministerial-session-of-the-comcec-istanbul-26-29-november-2018/>

Executive Summary

The OIC regions' overall credit information systems fall far below global benchmarks, with private registry coverage at only 11% of the adult population in 2016, based on World Bank data compared to 66% of coverage across the OECD.



OIC private/public registry coverage adult population in 2016



OECD private/public registry coverage adult population in 2016

1. Credit information systems have proliferated globally, playing an indispensable role in removing information asymmetry between financial institutions and borrowers. However, the OIC regions' overall credit information systems fall far below global benchmarks, with private registry coverage at only 11% of the adult population in 2016, based on World Bank data compared to 66% of coverage across the OECD.
2. Based on this Reports original analysis, enhancing the OIC credit information ecosystem could boost private-sector lending in the least developed OIC member states by an estimated \$670 bill a year.¹ In addition, rates of non-performing loans could potentially be reduced by 7.75 percentage points, based on OECD empirical observations of Latin American Countries². Other key benefits include financial inclusion of MSME's, FDI growth and Intra-OIC trade boost.
3. Based on a comprehensive gap analysis across the OIC, as well as comparing global credit information best-practices and trends, this Report concludes that OIC Business Intelligence Center (OBIC) is a much-needed solution to bridge the credit information gap in the OIC. COMCEC through its pivotal role coordinating economic cooperation between member countries across the OIC is well-positioned to enhance the credit reporting ecosystem in the OIC, as well as facilitate trade between countries.
4. The vision of OBIC is to enable all OIC MCs to have the strongest investment, financing, and trade development in the world through a best-in-class business growth and risk management intelligence ecosystem. OBIC will be based on four strategic pillars of a) country-level credit reporting ecosystem development (addressing four different tier of credit maturity levels amongst OIC countries) b) cross-OIC credit data infrastructure, c) capability development, d) and its own operational excellence with a sustainable business model.
5. A cross-OIC credit registry and infrastructure will be a hallmark of the Centers offerings, providing both the technology platform as well as credit data infrastructure that can be leveraged at country level (for those with no or very little credit infrastructure) or those ready to share and leverage cross-border credit intelligence.
6. The Center will work closely with leading regional and global technology players in the industry, providing the Center with best-in-class capabilities to serve the OIC markets. New technology capabilities such as blockchain and machine learning/ artificial intelligence will be considered in producing business credit intelligence and its data integrity.

¹ Based on applying credit information to private-sector loan correlation evidence by a World Bank & Harvard University study of OIC member countries.

² Turner, Michael and Varghese, Robert. The Economic Consequences of Consumer Credit Information Sharing: Efficiency, Inclusion, and Privacy. 2010:Organization for Economic Cooperation and Development.

OBIC Strategic Plan



OBIC will generate

\$3.8

million revenues



Operating Profitability

\$0.8

million

7. The Center will require a total investment and operational budgets of \$5.8 million so to ensure financial sustainability in the medium term. By providing tailored-made solutions and services to key stakeholders, the Center will be able to generate positive results after the fifth year.
8. Over a five-year period, the Center will implement plans to generate \$3.8 million as revenues and \$0.8 million as an operating profitability, while its workforce will consist of a 20-member global team. These estimates are based on a detailed business plan customized and developed for this report, benchmarked against the consulting work of the World Bank and IFC, as well as the observed growth rate of select credit registries in the OIC, as well as Aman Union³ important experience. The OBIC expects to break even is in year 5. The Center's initial revenue stream will be derived by providing consulting services to MCs to help them establish or enhance credit reporting service systems, with a laser focus on countries with low credit maturity. By Year 2, as the Center matures, it will launch its cross-country database, amassing up to 12,000 users by Year 5.
9. Substantial support will be required from MCs across the OIC and multilateral institutions, with important legal and location considerations to be addressed in advance.
10. Since the Center will represent all MCs, its headquarters should be located within a country with a mature credit-reporting ecosystem and a robust mix of offices in each region of the OIC that spans the scope of credit maturity.
11. The Center's critical first step will be to achieve unanimity on where to establish its locations. Once consensus is reached, the Center will develop a legal framework that enables and governs the cross-sharing of data, with complete approval and refinement of the Center's plans.
12. As the Center launches and expands its role in credit registry, it will have greater potential to address other data-intensive sectors - such as healthcare and insurance/takaful - fulfilling its broader role of economic development across the OIC.

³ Aman Union: is a professional forum assembling Commercial & Non-commercial Risks Insurers & Reinsurers in Member Countries of the Organization of the Islamic Cooperation and of the Arab League www.amanunion.net

Global Context and the need for an OIC response

The nature of business in the banking and export credit insurance industries has been changing exponentially, triggering voluminous transactions across the globe

1. The nature of business in the banking and export credit insurance industries has been changing exponentially, triggering voluminous transactions across the globe. Smart businesses realize that in this ultra-competitive, borderless business environment, a key factor of survival is agility; how quickly can they respond and adapt to change?
2. Information is often viewed as the second most important resource a company possesses (people normally rank at the top of the list of most valuable assets). Therefore, the firm that can make decisions based on timely, accurate information, can significantly improve its competitiveness by delivering products and services in a more predictable manner while minimizing risks. Credit information is an essential component for the economic and financial markets to execute properly. It can reduce the risk of default by providing real-time information on the borrowers (existing debt, credit lines with the banks, repayment difficulties, etc.).
3. While credit bureaus remain the primary medium for gathering and distributing reliable credit information – from collecting data from multiple sources on corporate entities or individuals, to consolidating this data into credit profiles – they remain inadequate in filling the gap in strategic decision-making intelligence information.
4. In today's ever-evolving digital world, the Business Intelligence (BI) is a business imperative for growth and sustainability, particularly in finance and trade. For all parties to prosper and protect assets, it is mandatory that sellers obtain sound information about their clients prior to entering into or expanding a contractual business relationships. Similarly, insurers also require precise data to minimize risks. Possessing reputable data allows organizations to make knowledgeable and informed business decisions, enhancing the competitive advantages of all parties involved.
5. In most of the developed countries across the globe, credit-reporting institutions are acknowledged as worthwhile but their value in fueling economic growth is virtually unrecognized. Capturing and translating data is instrumental in supporting vibrant economies, and results in transparency between credit reporting and lending activities; when blended properly, this synchronization drives expansion. Consequently, the availability of an authentic credit reporting system is one of the predominant factors to consider when assessing a country's readiness for doing business.
6. According to McKinsey & Company, "across most countries in Africa and in some countries in Asia and Latin America, the credit bureau can be a key enabler for expanding lending business, because it shares information about the payment behavior of consumers and commercial entities. Despite advantages of national credit bureaus, many developing countries either do not have them at all or have low-performing bureaus with extremely service coverage".
7. In the case of the OIC market of credit information, it remains generally underdeveloped with the lowest levels of credit penetration in the world. The Islamic Development Bank (IsDB) reports that 25 countries within the OIC are among the least developed countries and share many weaknesses, such as an increased informal economy, low utilization of technology and communications, educational challenges, decrepit legal frameworks, nominal financial capacity and poor intermediation, etc.
8. Most of the OIC member states have either an inadequate credit reporting system or none at all, the need for reliable, innovative Business Intelligence Centers superseded the need for basic credit reporting systems. Thus, any study towards achieving this goal should not neglect any previous efforts or attempts undertaken by institutions or organizations in the OIC member countries.
9. Undoubtedly, centralized updated and accurate business intelligence information reports can equip decision-makers with the proper tools. Business intelligence enables them to leverage information gathered quickly and remain proactive, and thus minimize damage for the interests of the MCs. Such data would serve as a cornerstone of customer due diligence (CDD), helping identify and manage the risk of money laundering, which all countries bear the

- responsibility of preventing through their commitment to the Financial Action Task Force (FATF).
10. Accordingly, the need arose for the creation and development of Business Intelligence Centers (BICs). Their function will include but not be limited to, the use of technologies, applications and best industry practices for the collection, integration, analysis, and presentation of business information to support better business decision-making.
 11. The intention of the OIC Business Intelligence Center (OBIC) is to allow both private and public stakeholders to access, gather, store and analyze corporate data to assist in making accurate and punctual business decisions. Other critical facets to be considered include: data collection and analysis, credit risk assessment, credit risk mitigation assessment, customer credit risk profile, debt restructure analysis, involved party exposure, non-performing loan analysis, outstanding analysis, portfolio credit exposure, security analysis, data mining (Data mining and knowledge retrieval are also valuable segments of business).
 12. A competitive advantage can be achieved once organizations directly correlate historical events with potential future events. This correlation can only be supported with organizational capabilities that can translate the organizations' informational needs and align them with respective available technology solutions.
 13. Given the avalanche of problems facing the business community in the OIC Member Countries, especially in procuring and accessing trustworthy, affordable business information on potential business partners, and building on the ICIEC's longstanding in-depth experience over the last 25 years in the field of credit insurance and database, the Corporation has decided to assess the feasibility to establish a financially viable and dedicated Business Intelligence Center for the OIC to address this pressing need.

Genesis of the project: Building on Aman Union success story

The Aman Union is an important first step in establishing an OIC-wide business intelligence ecosystem, established for the benefit of national export credit insurance agencies in the region, currently with a database of 233,078 buyers

1. In this regard, it is important to showcase the vast experience of ICIEC and its valuable contribution in researching the establishment of a common credit information Database Center; such a center will enable member Export Credit Agencies (ECAs) in Aman Union (AU) to obtain valid, timely and cost-effective credit information.
2. The launch of the AU was immensely beneficial in making informed underwriting decisions and substantially reduced the default ratio under the limits approved by ECAs.
3. The Aman Union laid the groundwork for establishing a Credit Information Database Center; it now serves the credit information needs of national Export Credit Agencies (ECAs). The union successfully launched its fully operational Database Center in December 2013, thus allowing its members to utilize the services of the Center.
4. The Aman Union is an important first step in establishing an OIC-wide business intelligence ecosystem, established for the benefit of national export credit insurance agencies in the region, currently with a database of 233,078 buyers.
5. The OBIC seeks to build on the successes of the Aman Union and create a scaled multilateral solution. Among other issues, the OBIC will tackle setting up the legal framework that governs the collection, treatment and sharing of business information with its primary public and private stakeholders and customers. It will also provide an architecture including well-conceived executive dashboards, user-friendly ad-hoc capabilities, and forward-looking predictive analytics.

Global and Regional Trends:

Market segmentation

analysis



Global and Regional Trends: Market segmentation analysis

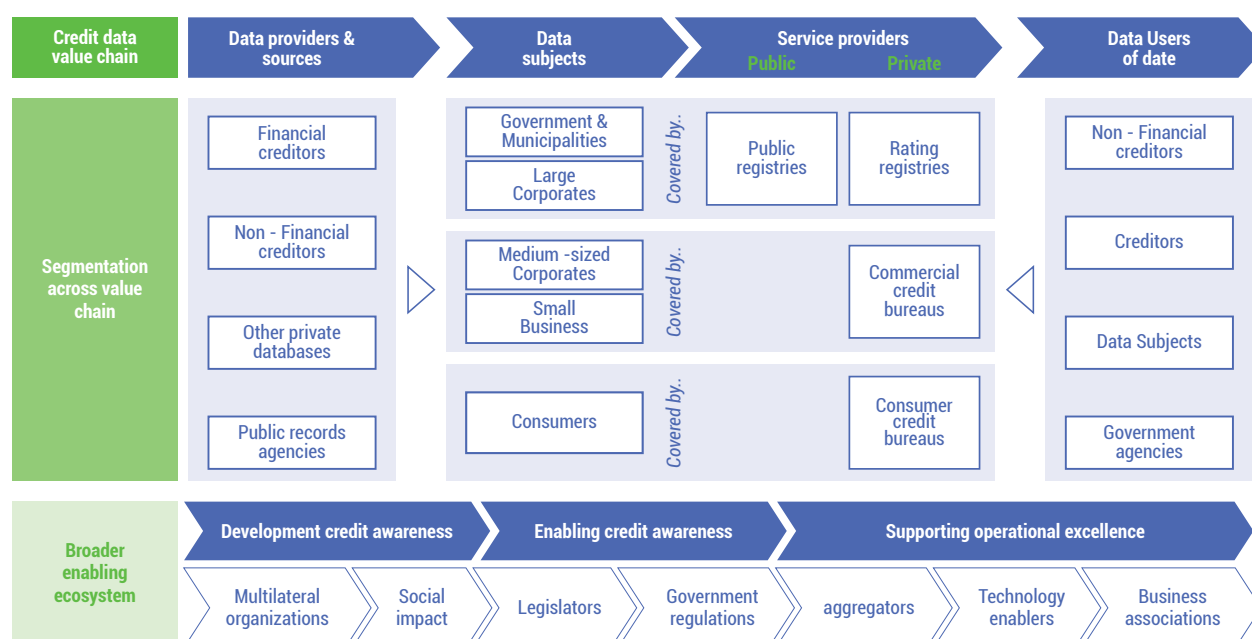
a) Global Ecosystem & Impact

1. This section provides an overview of the global credit reporting and value-added service ecosystems, their economic impact, regional adoption, key players, various ownership structures and their differing implications, with selected case studies,
2. Global Credit Ecosystem: Credit reporting is considered a fundamental pillar of financial stability within an economy, alleviating the information asymmetry between borrowers and lenders, and enabling efficient, low-cost lending. According to the International Committee on Credit Reporting,
3. The core drivers of credit reporting, as shown in the following diagram, are the service providers that collect data on subjects from various distinct sources, and present it to end users, to facilitate effective credit decisions.

and a summary of best-practices considerations.

the absence of credit reporting systems inhibits extending credit, and substantially raises the cost of financing.¹

Diagram: Global credit reporting ecosystem



Source: World Bank², IFC³, DinarStandard analysis and synthesis

¹ International Committee on Credit Reporting. The Role of Credit Reporting in Supporting Financial Sector Regulation and Supervision. 2016. <http://pubdocs.worldbank.org/en/954571479312890728/CR-2016-role-credit-reporting-in-supporting-financial-regulation.pdf>.

² World Bank. General Principles for Credit Reporting. 2011. http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/Credit_Reporting_text.pdf.

³ Stein, Peer. The Importance of Credit Bureaus in Lending Decisions. 2004. http://www.whcri.org/PDF/2004-Workshop-MX-ppt-The_Importance_of_Credit_Bureaus.pdf.

Summary of key ecosystem segments

Value chain segment	Description	Individual stakeholders	Description	Key Examples
Data providers and sources	Data providers are creditors and other entities that proactively and in a structured fashion supply information to credit reporting service providers.	Financial creditors	Institutions offering financial products, including banks, loan providers, and microfinance institutions.	Royal Bank of Scotland
		Non-financial creditors	Other types of credits including utilities and merchant traders.	National Grid; Verizon
		Other database providers	Collect and store unique bits of information on data subjects, such as rent payments or mortgage borrowing	DataVision
		Public records agencies	Publicly information made available through government-linked activities: drivers' or criminal records.	Department of Motor Vehicles
Data subjects	A data subject is an individual or a business whose data could be collected, processed, and disclosed to third parties in a credit reporting system. They are the subjects on whom lenders wish to assess the risks of default and nonpayment.	Government & Municipalities	Federal governments or local municipalities seeking to enter into financing arrangements.	U.S. Treasury
		Large corporates	Multinationals or scaled enterprises with > 100 employees that seek credit or wish to engage with various commercial stakeholders,	Cargill; Unilever
		Medium-sized corporates	Largely domestic businesses, with some possible trading activity, having less than 100 employees.	Bareburger
		Small businesses	Largely domestic and localized businesses with 20 employees or less and could include startups.	
		Consumers	Individuals who desire to enter into a contractual or financing arrangement.	
Service providers	Entity administering a networked credit information exchange, enabling credit information collection, processing, and further disclosure to users of data, as well as value-added services based on such data.	Public registries	A public credit registry (PCR) is a central database of individuals and companies with current information on repayment history, unpaid debts, or credit outstanding.	Reserve Bank of India
		Ratings agencies	A credit rating agency evaluates a debtor's ability to repay debt by making timely interest payments, and their likelihood of defaulting. An agency may rate the creditworthiness of issuers of debt obligations, of debt instruments, and of the servicers of the underlying debt.	Standard and Poor's (S&P) Moody's
		Commercial bureaus	Commercial credit bureaus compile business background information, financial records, banking/ trade and collection history to report risk scores and manage credit risk and business forecasting.	Dun and Bradstreet Experian
		Consumer credit bureaus	Consumer credit bureaus compile credit profiles on individuals based on past and current credit activities and generate credit scores, which lenders use as a measure of creditworthiness.	Equifax TransUnion
End users of data	An individual or business that requests credit reports, files or other related services from credit reporting service providers, typically under predefined conditions and rules.	Financial credits	Institutions offering financial products, including banks, loan providers, and microfinance institutions	Royal Bank of Scotland
		Non-financial creditors	Other types of credits including utilities, telecoms providers, landlords and merchant traders.	National Grid; Verizon
		Data subjects	Individuals or businesses whose data is being collected, stored and distributed.	
		Government agencies	Various government representatives that may need to assess users for specific reasons – tax authorities and judges.	IRS

Ecosystem enablers	Broader group of stakeholders that make the efficient operation of CSRPs possible, and ensure the positive economic and social impact on the users and subjects are maximized.	Multilateral organizations	Support governments around the world establishing sound credit reporting infrastructure, providing general principles.	World Bank; International Finance Corporation
		Social impact	Actively supports disadvantaged entrepreneurs and consumers, usually characterized by low incomes, to access the financial system and develop credit worthy credentials.	Firstaccess
		Legislators	Develop laws governing the responsible use and protection of data gathered.	Congress (U.S.)
		Government regulators	Regulators have the authority with statutory powers of supervision over credit reporting activities and services. Statutory powers may include the power to issue licenses and to create operational rules and regulations.	Federal Reserve Bank
		Aggregators	Package data from multiple CSRPs, supplemented by additional sources, such as news reports and in-house analysis, to enable users to assess data subjects in a customized manner	Bloomberg
		Technology enablers	Develop the platforms for the purpose of collecting, safeguarding and disseminating information	Path Solutions
		Business Associations	Forums for credit bureaus and industry practitioners to collectively raise issues, sign mutual commitments and develop best practices	Associate of Consumer Credit Associations Suppliers (Europe), Consumer Data Industry Association (U.S.)

Source: World Bank⁴, IFC⁵, DinarStandard analysis and synthesis

4. **Economic Impact:** Credit information systems boost lending by nearly 50% of GDP, reduce costs substantially and can financially assimilate the 2 billion unbanked, with an observable impact on FDI.
5. According to an empirical study of 129 countries, undertaken by the World Bank and Harvard University, effective credit reporting systems have been empirically shown to increase private sector lending approximately 47.5% of GDP⁶. This impact serves as a baseline for developing countries - excluding the most advanced ones - such as the U.S. and U.K. that have advanced existing credit ecosystems.
6. A Trans Union study reports that the availability of comprehensive credit information can increase lending volumes by 11%, based on empirical evidence in the US⁷. Additionally, a comprehensive report by Turner and Varghese indicates this will reduce the rates of non-performing loans by 7.75 percentage points, based on empirical evidence in Latin America.⁸
7. Furthermore, credit registry systems have a profound impact on attracting FDI by making available critical information to potential international investors and financiers; it is a critical component of financial market development. A robust econometric study in a World Bank Economic Review notes that the impact of financial market development spanning 29 emerging economies between 1994 and 2006 revealed a remarkably high 97% correlation between foreign direct investment and financial market development.⁹ Another important benefit is the enhanced ability to progress AML and CTF efforts.
8. The continued development and refinement of credit reporting systems worldwide is of paramount importance and can dynamically enhance financial inclusion, helping incorporate the 2 billion currently unbanked and underserved adults. According to World Bank, this accounts for 31% of the global adult population.¹⁰

⁴ World Bank. General Principles for Credit Reporting. 2011. http://siteresources.worldbank.org/FINANCIALSECTOR/Resources/Credit_Reporting_text.pdf

⁵ Stein, Peer. The Importance of Credit Bureaus in Lending Decisions. 2004. http://www.whcri.org/PDF/2004-Workshop-MX-ppt-The_Importance_of_Credit_Bureaus.pdf

⁶ Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer. 2007. Private Credit in 129 Countries. *Journal of Financial Economics* 12 (2): 77-99. <https://www.nber.org/papers/w11078>

⁷ The Importance of Credit Scoring for Economic Growth. 2007:TransUnion, LLC. https://www.transunion.com/docs/interstitial/TransUnion_WhitePaper_CreditScoring.pdf

⁸ Turner, Michael and Varghese, Robert. The Economic Consequences of Consumer Credit Information Sharing: Efficiency, Inclusion, and Privacy. 2010:Organization for Economic Cooperation and Development.

⁹ Causality between FDI and Financial Market Development: Evidence from Emerging Markets. *World Bank Economic Review*, Vol 29, Issue suppl_1, 1 January 2015, Pages S205-S216. <https://doi.org/10.1093/wber/lhv015>

¹⁰ Findex Financial Inclusion. 2017. World Bank.

9. **Role in trade:** Despite the existence of global credit bureaus, cross-border information sharing remains limited to only large-and-medium-sized enterprises. The movement of data, while essential, does not occur in a standardized manner; World Bank notes that this is constricted by variances in data protection laws and lack of systemized requirements.¹¹
10. Trade finance was estimated to climb to a stratospheric \$12.3 trillion globally in 2016, with a projected growth to \$14.8 trillion by 2020, at a CAGR of 3.7%. Dinar Standard reports that bank financing would account for only 35% of transactions, with the balance addressed largely through open credit arrangements between buyer and seller (accounting for 45% of total financing), and direct cash payments (accounting for 20% of financing).¹²
11. **Cross-border credit intelligence:** Several regional efforts have been initiated to facilitate cross-border information sharing, which is promoted the World Bank:
- A hub-and-spoke model exists across Central America, operated by TransUnion Central America, with a hub in Guatemala, and supported by regional spokes in Honduras, El Salvador, Costa Rica, and Nicaragua (see case study). The operation represents an excess of 40 million people. Credit information for each country is stored in silos, and is efficiently distributed to users in all countries. The IFC states that the existence of a single entity has made credit sharing economically feasible and also expedites trade.¹³
 - The hub-and-spoke model is optimal for smaller markets where establishing individual CRSPs would not be financially viable. Further, the IFC notes that under the hub-and-spoke structure, a single, internationally operating CRSP is established to serve multiple small markets.¹⁴
 - The ECB reports that in the EU, central banks in countries with credit registries have signed a memorandum of understanding, enabling the limited transfer of data on data subjects between those countries in order to facilitate the extension of credit¹⁵
 - According to the IFC, in order for cross-border data flows to be supported, certain preconditions should be actualized. This includes a demonstrated need for such data flows, based on the existence of strong financial and economic integration of the relevant markets, national-level policies for financial integration, small market size, and the economic viability of creating systems that enable such cross-border data flows.
12. **State of Global Adoption:** Worldwide, 154 economies reported credit information service providers in 2015, led by the OECD. However, 31 did not have a credit information infrastructure, which was a sizable gap.
13. According to the World Bank's Doing Business Report 2015, 154 out of 189 economies surveyed had either a credit registry or bureau, with 31 not having either and four not providing information¹⁶. The DefaultRisk agency indicates the number of credit rating agencies exceeding 75 globally.¹⁷
14. The following observations can be inferred about the regional variations in credit information coverage, referencing the chart below:
- 64 of the 154 economies had the most vibrant credit reporting systems, reporting strong coverage and credit scoring capabilities, led by the OECD member nations
 - 93 of those 154 economies had substandard credit reporting systems that either lacked coverage, scoring capabilities or both, and in need of substantial support
 - The largest gap in basic credit reporting infrastructure is observable in Sub-Saharan Africa and Latin America, accounting for 20 of the 31 economies without bureaus
15. The continued development of credit report systems has been led by the World Bank that has published guidelines on credit report systems, and the International Finance Corporation (IFC) through its credit bureau advisory team.¹⁸
16. **Ownership Structures:** Further, the IFC reports that while public credit registries are publicly funded, and often operated by central banks, credit bureaus around the world are primarily privately owned, enabling them to innovate and provide a deeper range of services to the industry.¹⁹

11 General principles for credit reporting. 2011. World Bank. <http://www.worldbank.org/en/topic/financialsector/publication/general-principles-for-credit-reporting>

12 Shariah-Compliant Trade Finance. Salaam Gateway and DinarStandard. March 2017. <https://repository.salaamgateway.com/images/iep/galleries/documents/201704120808265506.pdf>

13 Credit Reporting Knowledge Guide. 2011: IFC.

14 Ibid

15 Memorandum of Understanding on the exchange of information among credit registers for the benefit of reporting institutions. March 2003. https://www.ecb.europa.eu/press/pr/date/2003/html/pr030310_2.en.html

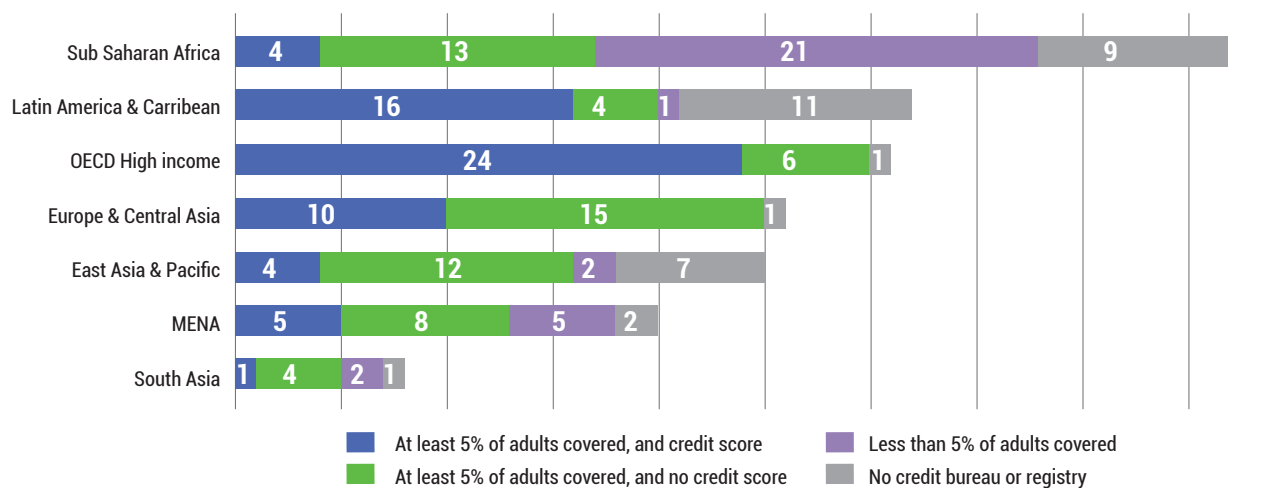
16 Doing Business 2015: Going Beyond Efficiency. 2015: World Bank. <https://openknowledge.worldbank.org/bitstream/handle/10986/20483/DB15-Full-Report.pdf>

17 Credit Rating Agencies: (Full Global List). October 2011. http://www.defaultrisk.com/rating_agencies.htm

18 Credit Reporting Knowledge Guide. 2011: IFC.

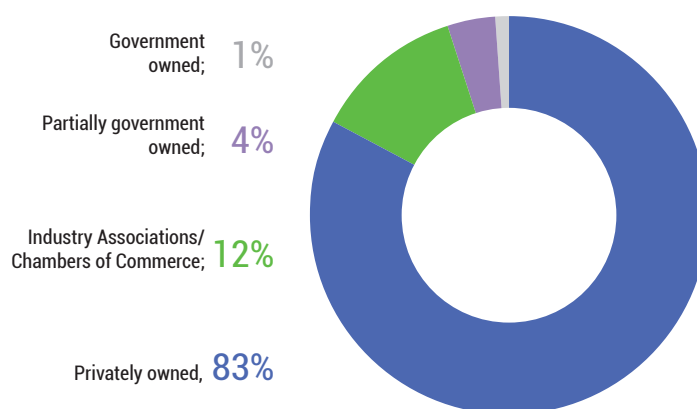
19 Ibid

Chart: Number of economies with credit rating bureaus or registries, 2015



Source: Doing Business 2015²⁰

Chart: Ownership structure of credit bureaus



Source: IFC²¹

17. According to the World Bank's Doing Business survey data, from 54 of 106 credit bureaus worldwide, 39% were owned by banks, financial institutions, or credit cards providers; 12% were held by industry associations or chambers of commerce, and only 4% were partially held by governments.²²

18. **Leading service providers:** The dominant credit intelligence entities globally are Dun and Bradstreet and Equifax.

20 Credit Rating Agencies: (Full Global List). October 2011. http://www.defaultrisk.com/rating_agencies.htm

21 Ibid

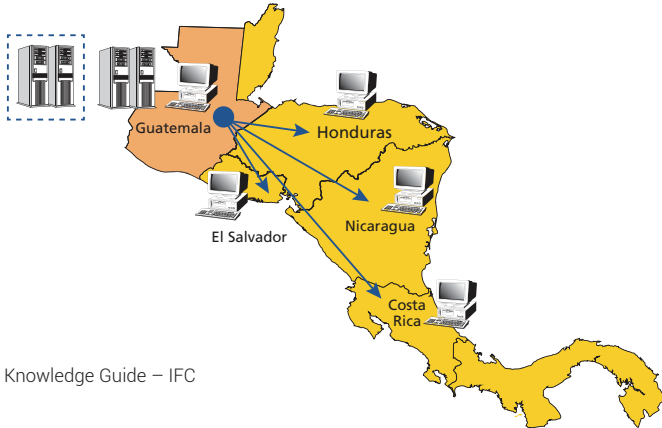
22 Ibid

Table: Leading entities

Name	Service Provider Type (Public registry, ratings agency, commercial bureau, consumer credit bureau)	Subject (SMEs, Large Corporates, Consumers)	HQ	Geographic Scope	#of Employee	Services			
						Customer Relationship Management	New Business Acquisition	Collections	Prospecting
Dun and Bradstreet	Commercial bureau	SMEs	United States	Global – 80 Countries; Americas Europe Middle East Africa Asia Pacific Oceania	4,900	X	X	X	
Equifax, Inc.	Consumer credit bureau	Consumers	United States	Global – 24 Countries; Americas, Europe Asia Pacific	10,300	X	X	X	X
Experian	Commercial bureaus	SMEs	Ireland	Global – 42 Countries; Americas Europe Middle East Africa Asia Pacific	15,587	X	X	X	
TransUnion	Consumer credit bureau	Consumers	United States	Global – 30 countries; Americas Europe Middle East Africa Asia Pacific	4,700	X	X	X	X
Graydon	Consumer credit bureau	Consumers	Netherlands	3 Countries in Europe (United Kingdom, Netherlands, Belgium)	324	X	X	X	
Sinotrust	Consumer credit bureau	Consumers	China	China only	800	X	X	X	
Credit.net (Infogroup)	Commercial bureaus	SMEs	United States	Americas	~3,200 *(Infogroup total)	X		X	
CreditInfo	Consumer credit bureau	Consumers	Iceland	Global – 28 countries; Americas Europe Middle East Africa	400	X		X	X
Creditsafe	Commercial bureaus	SMEs	United Kingdom	Global – 12 countries; Americas Europe Asia Pacific	1,200	X		X	
Standard & Poor's (S&P)	Credit rating agency	Corporates	United States	Global – 30 countries; Americas Europe Asia Pacific Middle East Africa	20,000	X			
Fitch Group	Credit rating agency	Corporates	United States & United Kingdom	Global – 30 countries; Americas Europe Asia Pacific Middle East Africa	2,000	X			
Moody's	Credit rating agency	Corporates	United States	Global – 30 countries; Americas Europe Asia Pacific Middle East Africa	10,600	X			

Global Case studies: Below are select case studies of leading global enterprises in business growth and risk intelligence.

Dun and Bradstreet (United States)	
Core activities	<p>Dun and Bradstreet (D&B) provides commercial data, analytics, and insights for businesses</p> <ul style="list-style-type: none"> The company provides credit and risk management products, including D&B Direct (online subscription credit risk solution), DNBi Risk Management (online subscription credit rules and policy automation), CreditSignal (credit score and rating alerts), Credit Builder (credit monitoring), Business Information Report (detailed company reports), and Small Business Finance Exchange (small business data solution). The company's marketing and sales solutions include D&B Hoovers (sales acceleration platform), D&B Optimizer for Marketing (cloud platform to target audiences), and D&B Market Insight (data analysis and visualization tool). The company's analytics and master data solutions include D&B Data Exchange (data tool). Other products include D&B Direct for Supply (supplier data and analytics), D&B Onboard (information and research tool), and Beneficial Ownership (compliance platform).
Scale and growth	<ul style="list-style-type: none"> Dun and Bradstreet has a database of 285 million commercial entities and 100 million associated contacts
Countries served	<ul style="list-style-type: none"> Global Americas (8) Europe (33) Middle East (13) Africa (2) Asia (22) Oceania (2)
Profitability	<ul style="list-style-type: none"> Dun and Bradstreet's revenue grew from \$1.58 billion in 2014 by 3.3% CAGR to \$1.74 Billion in 2017. Gross Income was an estimated \$1.0 billion in 2014 and grew by 2.9% CAGR to \$1.09 billion in 2017.
Key learnings	<p>Dun and Bradstreet is a public company listed on the New York Stock Exchange that offers information on commercial credit as well as data and reports on businesses globally. D&B is recognized for its Data Universal Number System (D.U.N.S.) that generates business credit profiles and information reports on 285 million commercial entities.</p>

TransUnion – Central America	
Core activities	<p>TransUnion Central America is a significant credit information and analytics provider in Central and Latin America through partnerships and acquisitions. The company maintains credit bureau files for millions of Central and Latin America consumers and provides business intelligence solutions for financial, commercial and industrial markets.</p> <p style="text-align: center;">Hub & Spokes Model in Central America</p>  <p style="text-align: center;">Source: Credit Reporting Knowledge Guide – IFC</p>
Countries served	<ul style="list-style-type: none"> TransUnion Central America currently serves Costa Rica, Guatemala, El Salvador, Honduras, Nicaragua, Chile, Colombia, Dominican Republic, Puerto Rico and Trinidad & Tobago.
Profitability	<ul style="list-style-type: none"> TransUnion's revenue grew from \$1.3 billion in 2014 by 14.1% CAGR to \$1.93 Billion in 2017. Gross income was an estimated \$574.6 million in 2014 and grew by 22.3% CAGR to \$1.05 billion in 2017.
Key learnings	<p>TransUnion has become an integral part of the Central American region by developing as a shareholder in local bureaus, establishing state-of-the-art data centers and expanding activities across Central American countries.</p>

- 19. **Aman Union:** Besides the above three case studies of OIC-based credit registries, credit bureaus and rating agencies, it is important to also highlight Aman Union, a multilateral effort within OIC countries for establishing cross-border credit information database to support national export credit insurance agencies. Aman Union is a professional forum assembling commercial and non-commercial risks insurers and reinsurers in member countries of the OIC and of the Arab League, established in 2009.
- 20. **Build on the success of the Aman Union database project:** The recent establishment of the Aman Union database seems to be a good start in the direction towards cross-OIC credit information sharing. This database is an initiative by the AU and is the first of its kind in the Islamic and Arab region, established for the benefit of national export credit insurance agencies in the region and enables the subscribers in the database to share and purchase credit information reports, credit opinions on entities worldwide and to exchange their underwriting experience on buyers and banks. The database was officially launched during the Fourth Annual Meeting of the AU held in Qatar on 10 December 2013 and is currently providing its services to 10 of its members. The current available database on buyers at the UNION stands at 233,078 buyers.

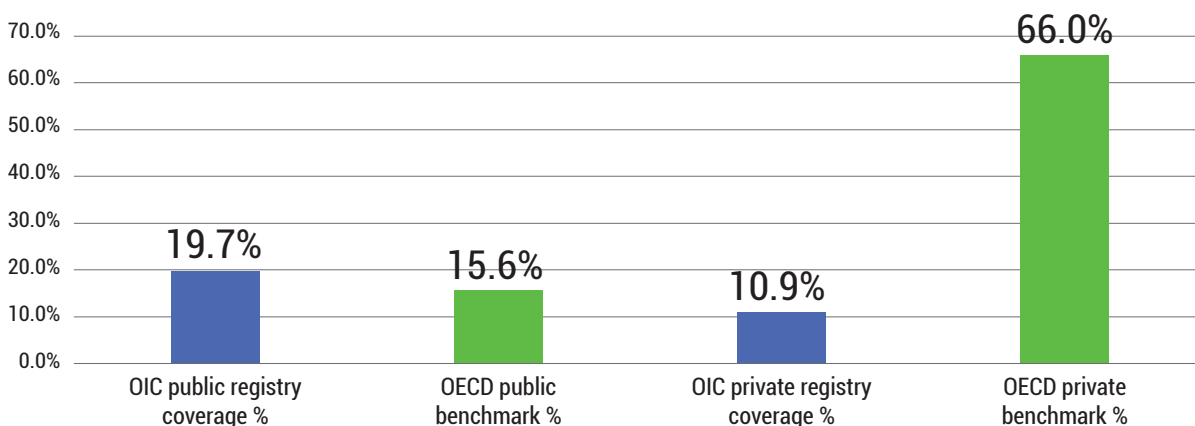
b) OIC Ecosystem & Impact

- 21. The OIC credit ecosystem falls substantially below the OECD benchmark in terms of private credit bureau population coverage, with greater reliance on limited-scope public registries.
- 22. The 57 Muslim-majority countries are set to exhibit strong economic growth, growing by 6.2% between

2016 and 2022, representing 1.6 times the G7, and accounting for 15.3% of the global economy in 2016.²³

- 23. Credit reporting, however, is a critical need for supporting the elimination of poverty in the region, given that the OIC region represents a disproportionate amount of the world's least developed countries (LDCs), accounting for 13 of the 45 LDCs.²⁴
- 24. The OIC regions' overall credit information systems fall below global benchmarks, with private registry coverage at only 11% of the adult population in 2016, relative to 66% coverage across the OECD. There is greater public registry coverage, but with the scope of public registries more restricted, there is substantial room for improvement.
- 25. **Regional segmentation:** The GCC and Central Asia are the strongest regions for private credit bureau coverage, with Malaysia as a leading economy for private bureau coverage, far ahead of OECD benchmarks.
- 26. The OIC varies substantially, with the GCC's leading private credit coverage, followed by Central Asia and the remaining MENA region (which for the purposes of this analysis also includes Turkey and Iran). Public bureau coverage is led by East Asia, followed by MENA excluding the GCC.
- 27. A key point about the benefit and viability of a multilateral cross-border credit intelligence platforms and development services is that these are being successfully implemented across many other global regions. The hub-and-spoke model with TransUnion Central America is an example of how developing countries can become part of this opportunity. Similar platforms are also being run from South Africa, Europe, and West Africa.

Chart: OIC coverage of adult population, relative to OECD benchmark, 2016



Source: World bank data²⁵

23 World Economic Outlook. International Monetary Fund. 2017.
 24 Climate Vulnerability Monitor: A Guide to the Cold Calculus of a Hot Planet. DARA. 2012.
 25 Obtained and analyzed from World Bank website. <https://data.worldbank.org/>

Chart: 2016 Private bureau coverage of adult population, across the OIC, by region

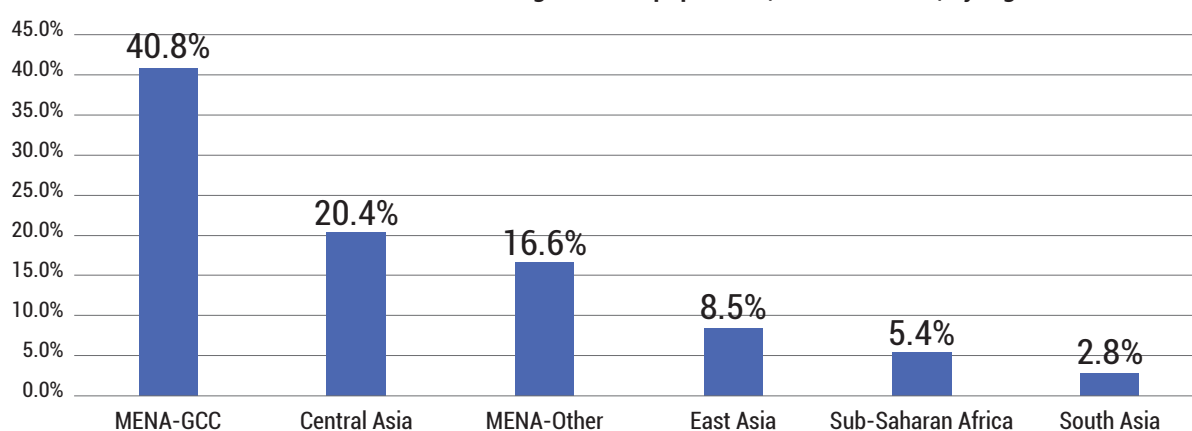
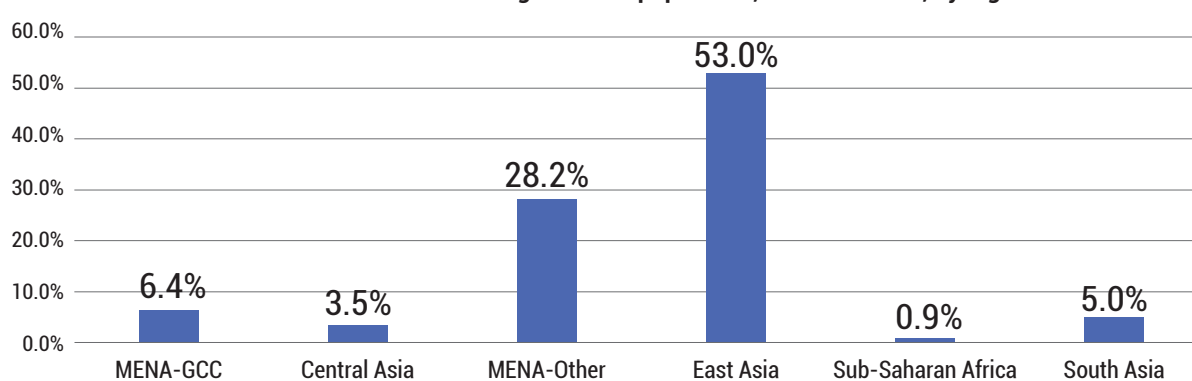


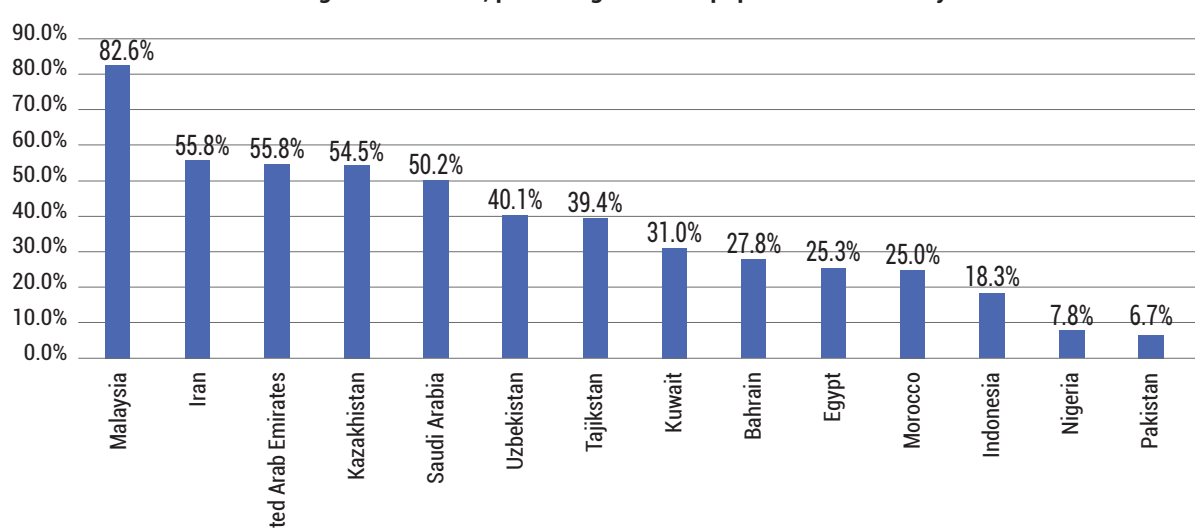
Chart: 2016 Public bureau coverage of adult population, across the OIC, by region



Source: World bank data²⁶

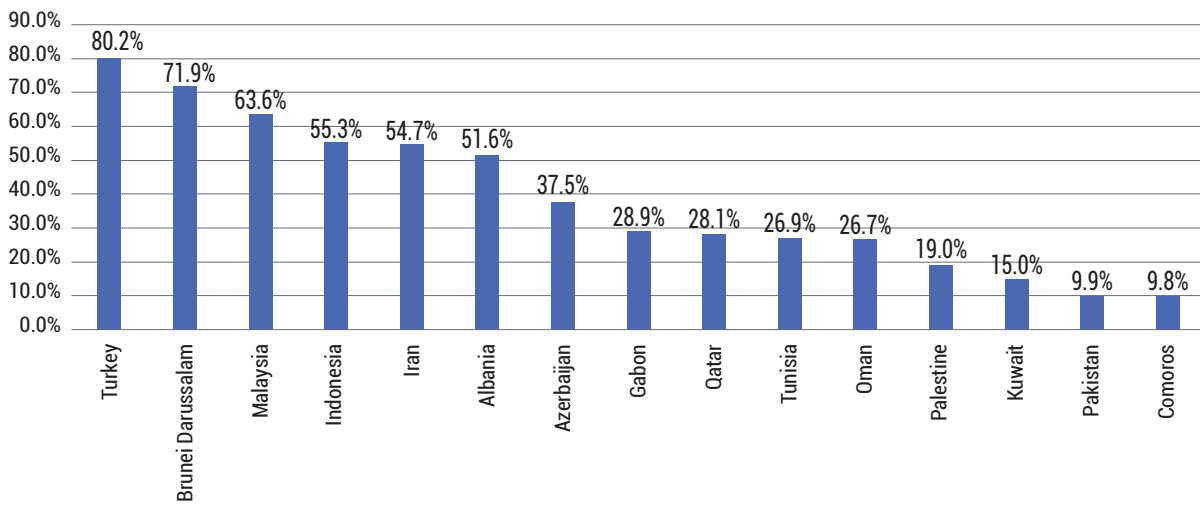
28. Country-level activity: Malaysia, Iran and the UAE represent top ecosystems for credit bureaus, while Turkey, Brunei Darussalam and Malaysia represent leading ecosystems from credit registries. Malaysia's strength of coverage for credit bureaus is particularly notable, far exceeding the OECD benchmark.

Chart: 2017 Leading OIC countries, percentage of adult population covered by credit bureaus



26 Obtained and analyzed from World Bank website. <https://data.worldbank.org/>

Chart: 2017 Leading OIC countries, percentage of adult population covered by credit registries



Source: World Bank Doing Business 2017

Leading OIC-based credit reporting service providers (CRSPs): The following table lists key credit reporting service providers in OIC countries.

Name	Service Provider Type (Public registry, ratings agency, commercial bureau, consumer credit bureau)	Subject	Head-quarters	No. of Employees	Services				
					Customer Relationship Management	Business Acquisition	New Business	Collections	Prospecting
The Benefit Company	Commercial/consumer credit bureau	Consumer	Bahrain	83	X	X	X	X	
The Credit Information Network - Ci-Net	Consumer credit bureau	Consumer/SMEs	Kuwait	20	X		X		
Em-credit	Consumer/commercial credit bureau	Consumer/SMEs	United Arab Emirates	20	X	X	X	X	
Al Etihad Credit Bureau	Public registry	Corporates/SMEs	United Arab Emirates	51-200	X				
I-Score	Consumer credit bureau	Consumer/SMEs	Egypt	11-50	X		X		
Central Bank of Egypt Central Credit Registry	Public registry	Corporates	Egypt	5000 (CBE Total)	X				
Central Bank of Jordan Credit Registry	Public registry	Corporates	Jordan	800 (CBJ Total)	X				
Central Bank of Oman's Credit and Statistical Bureau	Consumer/commercial credit bureau	Consumer/SMEs	Oman	282 (CBO Total)	X	X	X	X	
Central Bank of Qatar – Qatar Credit Bureau	Consumer/commercial credit bureau	Consumer/SMEs	Qatar	501-1,000 (CBQ Total)	X	X	X	X	
SIMAH (Saudi Credit Bureau)	Consumer/commercial credit bureau	Consumer/SMEs	Saudi Arabia	51-200	X	X	X	X	
CTOS Data Systems Sdn Bhd	Consumer/commercial credit bureau	Consumer/SMEs	Malaysia	201-500	X	X	X	X	
Kredi Kayıt Bürosu – KKB (Credit Bureau of Turkey)	Consumer credit bureau	Consumer	Turkey	201-500	X		X		
Middle East Rating & Investors Service	Credit ratings agency	Corporates	Egypt	2-10	X				
RAM Ratings	Credit ratings agency	Corporates	Malaysia	51-200	X				

OIC Case studies: Below are select case studies of leading OIC enterprises in business risk intelligence.

Al Etihad Credit Bureau (United Arab Emirates)	
Core activities	<p>Al Etihad Credit Bureau (AECB), also referred to as the Federal Credit Bureau, is a public credit registry according to an Arab Monetary Fund and World Bank Group report, has credit bureau functionality and provides credit information services across the seven Emirates.</p> <ul style="list-style-type: none"> • Al Etihad Credit Bureau is a public joint-stock company wholly owned by the United Arab Emirates Federal Government. The company is mandated to collect credit information regularly from both financial and non-financial institutions in the UAE. • Al Etihad Credit Bureau aggregates credit information data and analyzes this data to calculate credit scores and produce credit reports that are made available to individuals and companies across the United Arab Emirates. • The company helps both borrowers and financial institutions make better-informed decisions by adding transparency to the credit lending process.
Scale and growth	<ul style="list-style-type: none"> • In 2017, Al Etihad Credit Bureau's enquiries by subscribers increased by 44 % compared to the previous years. It currently manages 64 institutions, which increased from less than 30 in 2014.
Countries served	<ul style="list-style-type: none"> • United Arab Emirates
Key learnings	<p>Al Etihad Credit Bureau has developed strategic relationships with key financial institutions across the United Arab Emirates to become the most trustworthy credit reporting tool enhancing the financial infrastructure. The company has also leveraged technology to launch a credit scoring system for consumers.</p>

I-Score (Egypt)	
Core activities	<p>I-Score is the leading credit bureau in Egypt and is a database of credit information for consumers and SMEs</p> <ul style="list-style-type: none"> • The company has authorized users and institutions that are entitled to access I-Score's database to obtain creditworthiness reports on consumers, corporates and small businesses. • I-Score holds nearly 100% of Egypt's credit consumer data on both individuals and SMEs from commercial banks, and also has data on corporates. • The company provides credit information services and products including: <ul style="list-style-type: none"> - Self-inquiry via bank web portals - National ID verification - Credit score inquiry via ATMs - Account monitoring - MIS reports - Credit reports for consumers and SMEs - Signature verification - Application scoring - Bankruptcy
Scale and growth	<ul style="list-style-type: none"> • As of 31st December 2016, I-Score registered information of 11.9 million customers on its database including 184,145¹ enterprises.
Countries served	<ul style="list-style-type: none"> • Egypt
Key learnings	<p>I-Score leverages strategic relationships with 25 banks in addition to the Social Fund for Development to aggregate credit data and enhance transparency. In 2006, the company appointed Dun & Bradstreet international technology consultants to help improve their technology and know-how of credit bureau applications and processes. The credit bureau is now the leading credit information tool in Egypt.</p>

RAM Ratings (Malaysia)	
Core activities	<p>RAM Ratings services Berhad is the first and largest credit rating agency in Malaysia and Southeast Asia.</p> <ul style="list-style-type: none"> • The company provides independent credit ratings, research, risk analysis, bond pricing and credit information. • The company's portfolio encompasses corporate firms, sovereign countries, financial institutions, insurance companies, and structured finance obligations. • RAM Ratings is the world's leading rating agency for securities under Islamic principles. • The company rates both corporate companies and debt obligations, which can be requested by entities themselves or third parties. • The company leverages its website to disseminate rating news.
Scale and growth	<ul style="list-style-type: none"> • Established by the Central Bank of Malaysia, the company's mission was to support the development of Malaysia's bond market and have rated \$350 billion of bonds by 500 entities in Malaysia and 12 other countries. • Awarded Best Rating Agency (South East Asia 2017) by CPI Financial.
Countries served	<ul style="list-style-type: none"> • Malaysia • Southeast Asia (12)
Key learnings	<p>RAM Ratings is a leading credit rating agency focused on the bond market in Malaysia and Southeast Asia. The company's advantage is its full suite of credit rating offerings that help issuers access capital markets at competitive pricing levels. RAM Rating's extensive reach in bond ratings has led to its expansion as the largest credit rating agency in the region.</p>

c) External Factors

29. The following are key external economic, social, legal, and technological factors identified to be affecting global credit intelligence trends and needs:

Economic Drivers

- Alternative forms of credit reporting are being created, acknowledging limitations in traditional credit information. Alternative credit, such as records of rent and utilities payments, provide a more complete picture, and has been recognized as a need for credit reporting overall. The emergence of new peer-to-peer finance providers are driving a push for improved credit scoring information, with lenders such as Float, opting to analyze two years' worth of bank statements instead of reviewing FICO scores²⁷.
- New startups have also emerged to enable users to paint a more complete picture of their finances, such as DROPP (Digital Record of Payment Platform), allowing users to showcase their payment history across multiple expense accounts.
- One of the major global trade and investment developments is China's One-belt/One Road initiative. Many OIC countries are directly affected by it and can benefit tremendously with cross-trade and investments with China.

Social Drivers

- There is a greater than ever push towards financial inclusion. The emergence of microfinance institutions has not only played a role in increasing inclusion, but also driving growth in credit information in developing countries.²⁸
- The push for inclusion has led to efforts to incorporate individuals into the reporting ecosystem; and as such, organizations such as First Access²⁹ play a critical role in enhancing the coverage and scope of credit information.³⁰

Legal Drivers

- There is a need for a clear legal basis to have a full-functioning credit bureau. Better regulatory frameworks impact licensing of new bureaus, customers' rights and obligations in terms of update and use of credit information. The national governments and their entities have to establish the required regulatory basis to ensure the smooth running of these outfits. The relevant rules include bank secrecy regulations, data protection laws, and consumer protection provisions. Also, this is related to the collateral system available in the country as well as bankruptcy laws.³¹ Global efforts and responsibilities to address AML and CTF are also

²⁷ Harris, Ainsley. Why Lending Startups Like Float Want To Ditch The FICO Score. Fast Company. February 28, 2017. <https://www.fastcompany.com/3067953/why-lending-startups-like-float-want-to-ditch-the-fico-score>

²⁸ Findex Financial Inclusion. 2017. World Bank.

²⁹ First Access : Smart data platform for highly configurable credit origination, scoring, and management for lenders

³⁰ First Access website. <https://www.firstaccessmarket.com/about/>

driving the need for a legal basis to enable credit reporting.

36. Empirical evidence shows that legal origins are foundations for both creditor rights and information-sharing institutions. Findings suggest that public credit registries, a key feature of French civil law, benefit private credit markets in developing countries (based on cross-country determinants of private credit, using data on legal creditor rights and private and public credit registries in 129 countries.) English common-law-based jurisdictions have different implications.

Technological Drivers

37. Technology is speeding up credit information, with blockchain potential disaggregating the industry. The implementation of Artificial Intelligence is underway at the largest Credit Reporting Providers, notably Experian, pushing for greater accuracy, convenience and speed, partnering with Fintech company Finicity, to connect to a database of over 16,000 institutions.³² The Equifax breach in 2017, however, has raised substantial questions about the merits of centralizing

data. Blockchain poses a solution, disaggregating private data, for example, Bloom, a high potential startup that seeks to migrate lenders onto its Ethereum-based platform³³.

d) OIC Credit Intelligence Ecosystem Gaps and SWOT Analysis

38. A wide variation in maturity exists across the credit intelligence ecosystem of OIC member countries. It is important to develop a robust understanding of the various levels of maturity and likely benefit from OBIC proposed platform.
39. **Gaps and OIC Member Countries' Credit Intelligence Ecosystem Maturity Analysis:** Based on the global benchmarking with OIC countries' adoption of credit registries and credit bureaus, a four-quadrant segmentation of the different OIC markets maturity levels are presented below. Tier A represents countries with >50% population covered in public registry or private bureaus. Tier B represents 10%-50%. Tier C represents 1%-9%. Tier D represents 0%. The raw data is referenced in the Appendix:

Table: OIC Business Intelligence Maturity Quadrants

Tier A	Tier B	Tier C	Tier D
Turkey	Albania	Cameroon	Djibouti
Malaysia	Azerbaijan	Comoros	Burkina Faso
Brunei Darussalam	Tajikistan	Nigeria	Niger
UAE	Kuwait	Syria	Guinea-Bissau
Kazakhstan	Kyrgyzstan	Mauritania	Mali
Indonesia	Qatar	Uganda	Gambia
Iran	Uzbekistan	Mozambique	Guinea
Gabon	Tunisia	Algeria	Iraq
Saudi Arabia	Bahrain	Jordan	Somalia
	Morocco	Chad	Suriname
	Oman	Cote d'Ivoire	Turkmenistan
	Maldives	Sudan	
	Lebanon	Sierra Leone	
	Egypt	Yemen	
	Guyana	Bangladesh	
	Pakistan	Afghanistan	
	Palestine	Benin	
		Senegal	
		Libya	
		Togo	

Source: DinarStandard analysis based on World Development Indicators 2017 data on public credit registry coverage (% of adults) & private credit bureau coverage (% of adults).

31 Djankov, Simeon, Caralee McLiesh, and Andrei Shleifer. 2007. Private Credit in 129 Countries. *Journal of Financial Economics* 12 (2): 77-99. <https://www.nber.org/papers/w11078>

32 Experian and Finicity Collaborate on Digital Lending. Finicity. January 11, 2018. <https://www.finicity.com/press-release-experian-finicity-collaborate-digitize-lending-marketplace-easier-quicker-less-tedious-experience-consumers-lenders/>

33 Vitaris, Benjamin. How One Blockchain Startup Is Combatting Centralization of the Credit Industry. *Bitcoin Magazine*. September 12, 2017. <https://bitcoinmagazine.com/articles/how-one-blockchain-startup-combatting-centralization-credit-industry/>

40. The above segmentation is a critical consideration in devising an effective strategy for OBIC services development. An additional aspect is to consider the regional breakdown. The tables below showcase regional distribution of OIC member countries by credit intelligence ecosystem maturity levels:

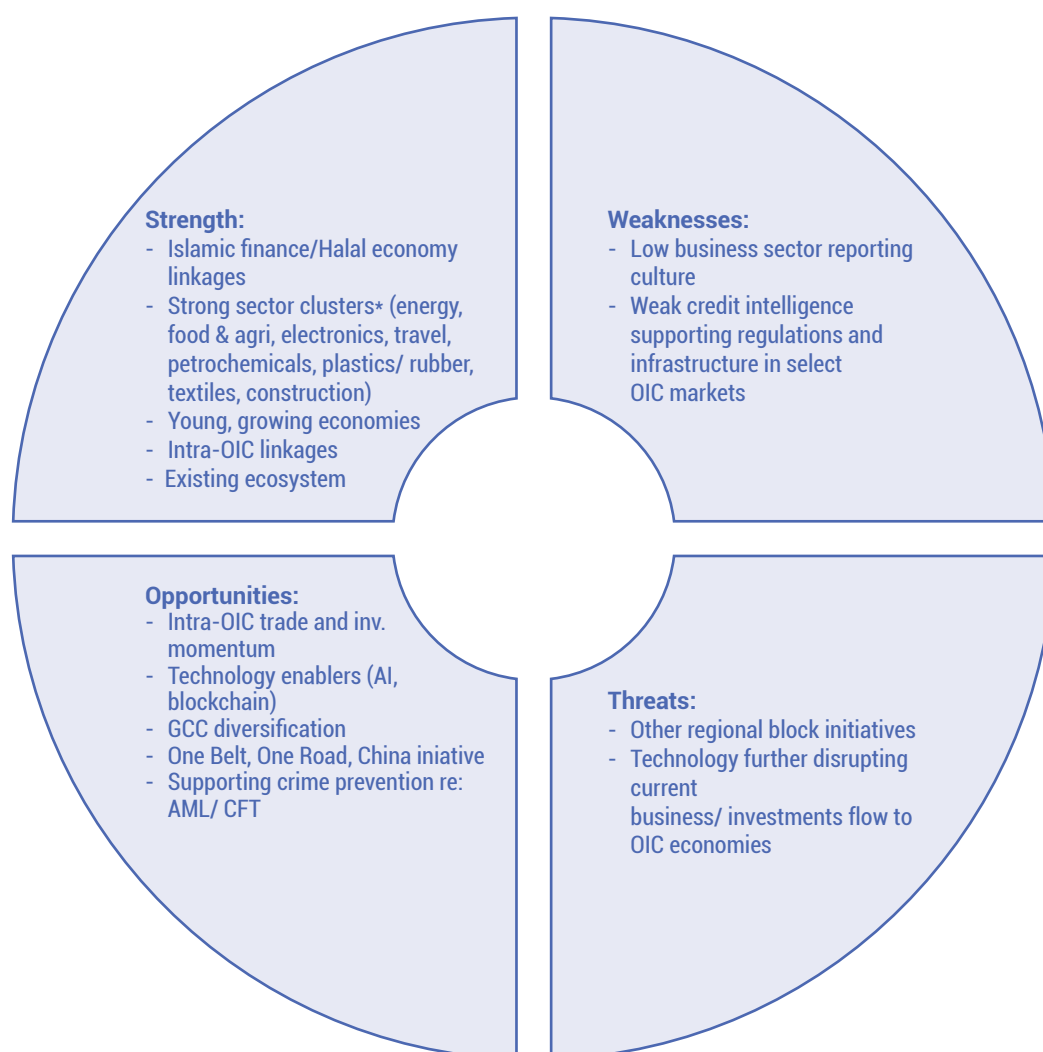
Table: OIC Business Intelligence Maturity – By Region

West		Central Asia		MENA-Other		MENA-GCC		South Asia		Sub-Saharan Africa		East Asia	
Guyana	B	Kazakhstan	A	Turkey	A	UAE	A	Maldives	B	Gabon	A	Malaysia	A
Albania	B	Azerbaijan	B	Iran	A	Saudi Arabia	A	Pakistan	B	Cameroon	C	Brunei Darussalam	A
Suriname	D	Kyrgyzstan	B	Tunisia	B	Kuwait	B	Bangladesh	C	Comoros	C	Indonesia	A
		Uzbekistan	B	Morocco	B	Qatar	B	Afghanistan	C	Nigeria	C		
		Tajikistan	B	Lebanon	B	Bahrain	B			Mauritania	C		
		Turkmenistan	D	Egypt	B	Oman	B			Uganda	C		
				Palestine	B					Mozambique	C		
				Syria	C					Chad	C		
				Algeria	C					Cote d'Ivoire	C		
				Jordan	C					Sudan	C		
				Yemen	C					Sierra Leone	C		
				Libya	C					Senegal	C		
				Iraq	D					Togo	C		
										Djibouti	D		
										Burkina Faso	D		
										Niger	D		
										Guinea-Bissau	D		
										Mali	D		
										Gambia	D		
										Guinea	D		
										Somalia	D		
										Benin	D		

Source: DinarStandard analysis based on World Development Indicators 2017 data on public credit registry coverage (% of adults) & private credit bureau coverage (% of adults)

OIC Member Countries' SWOT Analysis

Based on the comparison of global benchmarking with OIC countries' adoption of credit intelligence ecosystem and other external drivers, below is a preliminary SWOT analysis of OIC economies' credit intelligence ecosystem.



* DinarStandard analysis of Top 10 OIC Industry Clusters Report 2015

OBIC

Strategic

Plan



OBIC Strategic Plan

7.1 Vision and Mission of the OBIC

- Based on the market analysis carried out earlier, there is a clear need to drive an improvement in the OIC credit ecosystem, which has been acknowledged and supported by stakeholders. Accordingly, we have laid out the vision and strategic pillars that underpin OBIC establishment.

Setting the business intelligence Strategic Plan for OBIC



- Vision:** "The vision of OBIC is to enable all OIC MCs to have the strongest investment, financing, and trade development in the world through a best-in-class business growth and risk management intelligence ecosystem".
- Mission:** "To deliver the vision set out, establish a pan-OIC coordinating business intelligence center that drives credit maturity in each of the OIC MCs".

7.2 OBIC Strategic Pillars

4. The OBIC will operate through the following Four Strategic Pillars aiming at achieving the vision and implementing duly the mandate:
 - a) **Strategic Pillar 1: Country development:**
Provide first-line support for countries to develop and enhance their individual credit reporting ecosystems.
 - b) **Strategic Pillar 2: Cross-Country development:**
Build a comprehensive, OIC-wide data infrastructure.
 - c) **Strategic Pillar 3: Operational excellence:** Create a leading and optimized operational model that supports the center's sustainability.
 - d) **Strategic Pillar 4: Capability building:** Providing tools, guidelines and training to support self-sufficiency in credit reporting among MCs.

7.3 OBIC Strategic Objectives

OBIC Strategic Objectives are to achieve through the Four Strategic Pillars the stated vision and implementing the mandate are as follows:

- a) Build a best-in-class **business intelligence ecosystem development capability** to serve all OIC MCs (regulatory guidelines, data collection, security, consumer/creditor rights, cross-border data flow frameworks, PPP, Industry Association, other).
- b) Develop a best-in-class **business intelligence database/digital platform** that covers cross-border credit registry and linked credit bureau services (OIC wide with potential hub-and-spoke model).
- c) Provide **advisory services** including capacity building to MCs across the different maturity levels to drive business/credit intelligence impact across all members.
- d) Deliver an **optimal operational model** with key strategic partnerships and potential regional offices network and adoption of a model that serves all MCs at various maturity levels.
- e) Establish a strong business model for the center to ensure long-term impact and sustainability.
- f) (Future phase) Establish an OIC-wide rating agency that will provide reliable, affordable, and independent

creditworthiness of the MCs, including risk profile.

- g) Effective information sharing among member states' crime prevention bodies to create a clean financial ecosystem across the OIC.

7.4 OBIC is expected to greatly impact the OIC Investment and Trade inflows and outflows

5. Based on the earlier analysis of the gaps in OIC member countries compared to global credit information benchmarks, there are Five key Expected Impacts of the OBIC on the OIC MCs:

(1) Private-sector lending boost of estimated \$670 bill to OIC economies with least developed credit systems:

Full and effective availability of credit information and associated systems can boost private-sector lending within the least developed OIC member states by a conservative estimate of \$670 billion a year¹. This estimate is for the 32 OIC member countries with credit information available on less than 10% of their adult populations.

(2) Reduce rates of non-performing loans by 7.75 percentage points:

Based on validated Latin-America developing market evidence, we can estimate a similar impact on reduction of non-performing loans on OIC member countries.²

- ### (3) FDI boost:
- Given the strong correlation of FDI growth and strong financial credit information systems, the OIC members can most certainly also see positive direct impact on flows of foreign direct investments (FDI). An improving credit system will increase foreign investors' confidence in the domestic investments. In addition, in 2016, OIC countries were able to attract only US\$96.3 billion of FDI³. Comparatively, although there was US\$26.7 trillion in global inward FDI stock in 2016, OIC countries hosted only 6.6%.

- ### (4) Financial inclusion:
- OIC member countries suffer from the highest non-inclusion of financial system. While part of the reason is limited penetration of Islamic finance, a big part is the inability for financial institutions to evaluate risk through reliable credit information on MSMEs. On average, only 28 % of adults in the OIC countries hold a bank account at a formal financial institution, which further exasperates the challenge⁴. Efforts for crime prevention will also

¹ Based on applying credit information to private sector loan correlation evidence by a World Bank & Harvard University study to OIC member countries.

² Turner, Michael and Varghese, Robert. The Economic Consequences of Consumer Credit Information Sharing: Efficiency, Inclusion, and Privacy. 2010:Organization for Economic Cooperation and Development.

³ OIC Economic Outlook 2017. SESRIC. November 2017. <http://www.sesric.org/publications-detail.php?id=425>

be aided through deciding transaction linkages or acquiring transparency.

(5) Intra-OIC trade boost: A cross-border business-credit information source amongst OIC member countries will further boost existing trade linkages and preferential agreements. Nominal value of the total intra-OIC trade has grown from US\$363 billion in 2007, to US\$539 billion in 2016. The share of intra-OIC trade in total OIC trade rose from 15.38 % to 19.35 % in the same period.⁵ In a similar vein, in 2015 intra-OIC FDI inflows continued to remain under its potential and a few OIC countries, including Egypt, Turkey, Mozambique and Morocco, attracted more than US\$1 billion FDI from other OIC countries.

other related public and private stakeholders and civil society.

7. As per the resolution taken by the COMCEC Follow Up Committee (05 May 2018, Ankara, Turkey), the draft interim report has been submitted to the MCs and the deadline for submission of their feedbacks was set for the 31 July 2018.
8. Initial feedback from member countries has been positive with some recommendations, which were duly incorporated in this Report, with Turkey and Sudan expressing their support for the center, together with COMCEC Secretariat, and with Azerbaijan, Brunei, Egypt and the UAE acknowledging the proposed center without any objections.

7.5 OBIC stakeholder expectations and feedback

6. The primary target audience of the OBIC are financial creditors, non-financial creditors, government agencies seeking financing and investments within the OIC MCs. Key OBIC stakeholders are OIC MCs' central banks, credit registries, credit bureaus, business associations, chambers of commerce, and

⁴ "Role of Islamic Banking in Financial Inclusion: Prospects and Performance". Islamic Banking: Growth, Stability and Inclusion, pp.33-49. Palgrave: 2017.

⁵ COMCEC Trade Outlook 2017. October 2017. <http://www.comcec.org/en/wp-content/uploads/2017/11/2017-TRD-O.pdf>

OBIC

Solution

Framework

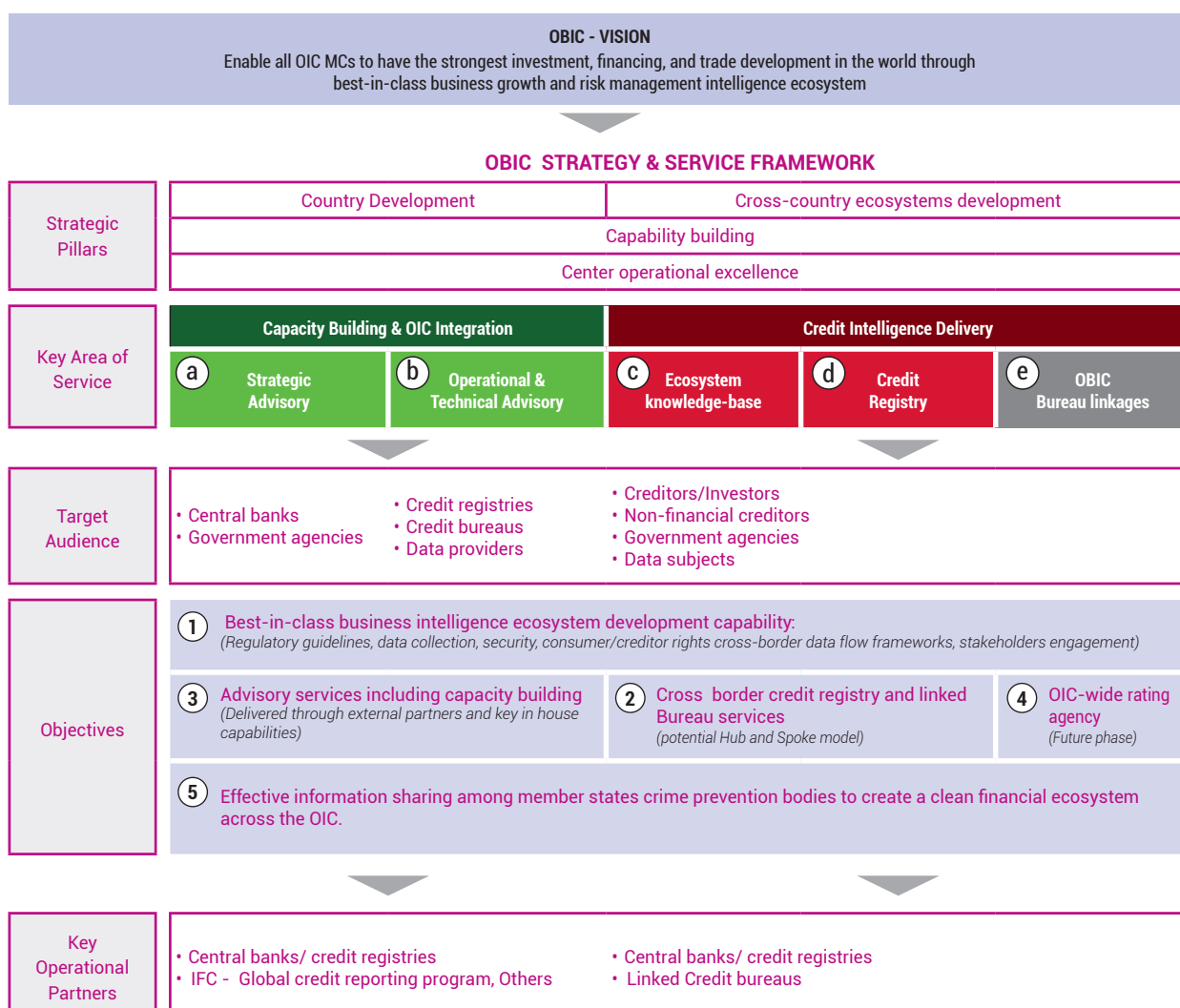


OBIC - Solution Framework

OBIC Proposed Services

- Given the strategic plan set out earlier, the OBIC will provide five core solutions to key public and private stakeholders. The Center will tackle through a detailed framework the main core solutions to be offered and how this maps to strategic objectives.

Vision, Services Framework , Strategic Objectives of the OBIC



a) Strategic Advisory

Core solution provided

- Governments and central banks in developing and least developed countries will need to have core strategic support in developing/implementing a roadmap to either enhance or install a credit-reporting ecosystem.
- Use case scenario: The central bank of a least developed country seeks to fund an infrastructure's project as part of the country's long-term economic plan and needs with guidance on strategy, impact and approach.

Case study	The World Bank Global Credit Reporting Program, which has provided advisory services to over 60 countries in 2013, with feasibility studies and assessments carried out for Egypt (in setting up I-Score), Algeria (Bank of Algeria), and Bangladesh (CIB) ¹ .
Proposed business model	Service fee, based on cost recovery plus minimal margin, with cost adjusted for lower-tier countries. Average engagement value of ~\$80k (~25% margin) ² Service offering to Tier D (least developed) countries: ~\$50k (~10% loss). <i>Cost for lower-tier countries reflects indicative cost of living adjustment³, comparing cost of living for select Tier D to Tier A countries.</i>

Case study	The World Bank Global Credit Reporting Program has provided full-fledged setup support to various countries establishing either new credit registries or bureaus, supporting Egypt, Bangladesh and Algeria with such initiatives.
Proposed business model	Service fee, based on cost recovery plus minimal margin, with cost adjusted for lower-tier countries. Average engagement value of ~\$80k (~25% margin). Service offering to Tier D (least developed) countries: ~\$50k (~10% loss). Cost for lower-tier countries reflect indicative cost of living adjustment ⁴ , comparing cost of living for select Tier D to Tier A countries.

b) Operational & Technical Advisory

Core solution provided

- Providing detailed implementation support in setting up credit registries and bureaus, including organizational design, regulatory considerations and technological design.
- Use case scenario:** The in charge of the Economic Development Ministry, along with select private investments, seeks to set up a private credit bureau. They require OBIC help in designing an optimal operational and technological infrastructure.

Case study	The World Bank Group and the IFC both provide training and consultations on best industry practices on a fee-based arrangement.
Proposed business model	Guides and content made available for free via the website, with in-person training a potential future offering.

c) Ecosystem knowledge-base (part of Operational and Technical advisory)

Core solution provided

- The knowledge base is a series of essential guides on best practices and considerations that are made available to all MCs, with supplementary courses and training made available

Use case:

- An OIC MC sets up a private credit bureau and has engaged the OBIC for operational advisory services. It needs relevant training materials to ensure that its staff are fully competent in executing their core roles.

1 Global Credit Reporting (GRP) Program. World Bank Group. January 2015. <https://www.ifc.org/wps/wcm/connect/f145c7004a52403c8f358f8969adcc27/Global+Credit+Reporting+Program+Presentation.pdf?MOD=AJPERES>

2 Based on in-house DinarStandard IP on advisory project economics.

3 Cost of Living Index for Country 2018 Mid-Year. Numbeo. 2018. https://www.numbeo.com/cost-of-living/rankings_by_country.jsp

4 Cost of Living Index for Country 2018 Mid-Year. Numbeo. 2018. https://www.numbeo.com/cost-of-living/rankings_by_country.jsp

d) Credit Registry

Core solution provided:

8. OBIC provides deeper support to select OIC countries with very limited credit reporting capabilities to set up, and in select cases, operate, credit registries, with the help of external partners.
9. OBIC develops the technology and credit data infrastructure that can be copied and shared with smaller OIC countries to implement at low cost.
10. For select countries in Tier D, where the cost of having a standalone operation is not feasible, OBIC provides the technology and also manages the data as a silo, with the support of an outsourced service provider, such as Experian.

Use case scenarios:

- (1) A least developed country with limited credit reporting capabilities needs support in setting up a credit registry cost effectively and leverages and builds on top of a technology infrastructure provided by OBIC.
- (2) A least developed country that is too small to operate a credit registry on its own (like Guatemala) needs OBIC to arrange to have an external partner to set up and operate a bureau cost effectively, while adhering to national laws on data protection and privacy.

Case study	Experian operates a hub-and-spoke model for several countries where the cost of establishing an independent credit registry is prohibitive, such as Guatemala. In such instances, Experian fully owns and operates the credit registry, keeping sensitive data in silos that cannot be shared outside of the country.
Proposed business model	<ul style="list-style-type: none"> • Ongoing license fee - \$25,000 (to validate)

e) OBIC Bureau linkages and cross-country registry

Core solution provided

11. OBIC creates a database that is linked to individual bureaus and extracts pertinent company data. The cross-country data model that can be accessed by institutions across the OIC to facilitate trade and FDI.

Use case

- (1) FDI: An investment company in UAE wants to make an equity investment in a company in Kazakhstan and leverages the database to conduct preliminary due diligence on the target.
- (2) Export credit insurance: A credit insurance company is seeking to issue a guarantee for a company in the UAE to export to a company in Malaysia and leverages the database to evaluate the creditworthiness of the Malaysian counterpart.

Case study	Dun and Bradstreet's global database provides streamlined data that includes a unique identifier, corporate hierarchy and lineage, key business performance indicators, and as a premium offering, provides continuous business monitoring to highlight any risks arising with existing supply relationships.
Proposed business model	<ul style="list-style-type: none"> • Basic subscription: \$250/year for a license, allowing unlimited downloads of company data and discounted market report access (price can increase once a comprehensive credit scoring feature is introduced). • One-off pricing <ul style="list-style-type: none"> o Company report: \$10 per report o Market report: \$100 per report o Per individual inquiry: \$1 per inquiry⁵ <p>Price discount of 25% for users in Tier C and Tier D countries</p>

⁵ Benchmarked and projected as lower than Dun and Bradstreet pricing, which charged \$500 per basic enterprise subscription, and upwards of \$50 per company report.

OBIC Success Factors & Solution Mitigation:

Success Factor	Solution Mitigation
<p>Legal and regulatory framework: There is a need for a clear legal basis to have a full-functioning OBIC advisory and credit intelligence services. It also needs a regulatory framework for credit ecosystem advisory work and intelligence services including customers' rights and obligations in terms of update and use of credit information.</p> <p>Such a framework can also increase the success rate of AML and CTF efforts across the OIC, and finally contributing to creation of a clean financial environment.</p>	<p>The relevant rules include bank secrecy regulations, data protection laws, and consumer protection provisions. Also, this is related to the collateral system available in the country as well as bankruptcy laws.</p>
<p>Ownership: A critical question is how OBIC ownership and governance structure be done and, in particular, how various partnerships will work – especially in the credit registry, and whether public, private, a joint venture, or perhaps a partnership between a local and a foreign entity.</p>	<p>As part of the roadmap, a consultation is recommended across all MCs to determine the optimal ownership structures that ensure robust geographical regional representation.</p>
<p>Technology: Advanced technology is important for data collection, dissemination and analysis. Reportedly, there is lack of technical know-how in building IT systems for credit bureaus.</p>	<p>Robust partnerships are suggested to ensure the center has a strong technological platform.</p>
<p>Awareness: In most of the economies of the OIC member countries, there are many companies that are not registered formally or properly, which may lead to inaccurate credit records, if any.</p>	<p>The center's fundamental role will be to work with MCs to improve credit maturity.</p>
<p>Coordination and supervision: Besides government regulations and supervision, there is a need for industry support by having an association for credit bureaus in OIC member countries that can provide exchange of expertise and networking.</p>	<p>The center's marketing activities will comprise convening key stakeholders across all MCs.</p>
<p>Small size of market in some MCs: Some countries have limited market opportunities to operate CIBs in terms of selling credit reports. In Sub-Saharan Africa, a country of 15-20 million may have about 200,000 credit records. CIBs operate on economies of scale.</p>	<p>As a solution, in Latin America, a hub was established so that CIB services for several countries is conducted through a common hub.</p>

<p>Limited data and data quality issues: Overall credit information data availability and quality are considered weak in the OIC region. For automation of decisions, critical mass, up-to-date and reliable data is required. Lack of standardization is another problem that prevails in most of OIC member countries.</p>	<p>The cross-OIC platform will help plug the gap in the ecosystem, enable more cost-effective collection and sharing of data, driving important trade outcomes.</p>
<p>High cost of information: Related to the above, not only that the cost of obtaining credible information is very expensive, but also maintaining it is also a high cost.</p>	
<p>Country versus cross-country credit information Addressing both country-specific and cross-country credit information needs.</p>	

OBIC

Financial

Plan

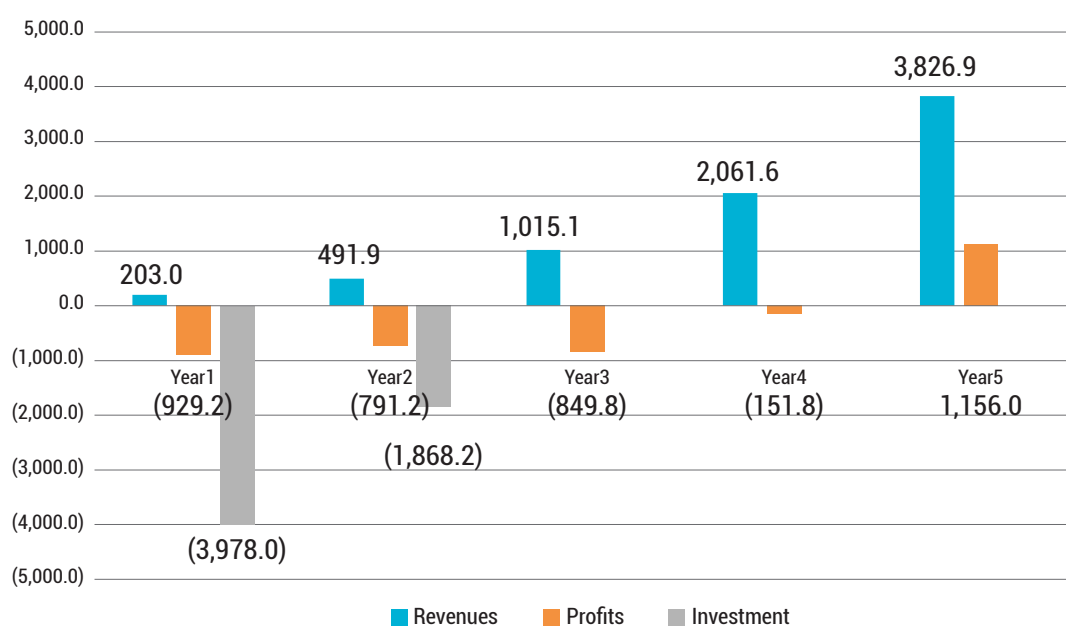


Financial Plan

Financial Overview

- Financial profile: OBIC will require \$5.8 million in investment capital, out of which \$3.9 million will be required within the first year of operations.
 - The center is expected to generate an operating profit in year 5 and revenue reaching 3.8.
- Direct costs: External project management costs and data acquisition costs are expected to represent 40% of revenues in Year 1, declining to 21% of revenues by Year 5 as OBIC operational infrastructure matures, and as the center benefits from scale.

Overview of OBIC financial profile, \$ in 000s



- Cash flow generation: The Center begins generating profit and cash flow on a monthly basis in Year 4, with profitability reaching \$0.8 million by Year 5, driven by the following:
 - Revenue generation: Revenues reach \$3.8 million by Year 5, ramping up following the launch of the cross-OIC platform in Year 2, which is projected to reach 12,000 users within three years of launch and represent 50% of revenues.
 - Indirect costs: Largely fixed costs spanning personnel, marketing and database management costs, starting at \$0.9 million in Year 1 and growing to \$2.2 million by Year 5, driven by increasing sophistication and scale of the technology infrastructure, and the build-out of the team to 20 individuals by Year 5.

OBIC operating profit and cash flows

OBIC 5 year financial projections

\$ 000s	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Revenues						
Strategy advisory		139.8	286.7	440.8	753.0	1,080.5
Operational and technical advisory		63.2	129.6	265.6	408.4	697.6
Platform licensing		0.0	25.6	52.5	80.8	110.4
Cross OIC platform revenues		0.0	50.0	256.3	819.0	1,938.4
Total revenues		203.0	491.9	1,015.1	2,061.6	3,826.9

Direct costs

Project external direct costs		(81.2)	(124.9)	(197.8)	(313.6)	(444.5)
Data acquisition costs		0.0	(8.0)	(52.5)	(144.0)	(375.0)
Total direct costs		(81.2)	(132.9)	(250.3)	(457.6)	(819.5)

Costs of operation

Personnel	(142.0)	(389.5)	(432.9)	(831.4)	(958.1)	(1,018.3)
Technology	0.0	(420.0)	(420.0)	(420.0)	(420.0)	(420.0)
Marketing	0.0	(101.5)	(147.6)	(203.0)	(206.2)	(229.6)
Other operation costs	0.0	(140.0)	(149.8)	(160.3)	(171.5)	(183.5)
Total indirect costs	(142.0)	(1,051.0)	(1,150.2)	(1,614.7)	(1,755.8)	(1,851.4)

Operating Profit	(142.0)	(929.2)	(791.2)	(849.8)	(151.8)	1,156.0
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Platform invest costs	(2,998.0)					
Working capital (half of first year)	(50.8)					
Working capital (ongoing)		(4.1)	(9.8)	(20.3)	(41.2)	(76.5)

Net cash flow	(3,190.8)	(933.3)	(801.1)	(870.1)	(193.0)	1,079.4
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4. Financial requirements: The Center requires \$5.8 million in investment over a two-year period, \$2.9 million of which will be needed to build a robust, scalable database, and with \$2.7 million to sustain operations in the first four years, primarily to support:
- Personnel costs (\$1.8 million through Year 3) and
 - Ongoing technology maintenance and marketing costs (\$1 million for both categories through Year 2).

Figure: Investment requirements by Year

\$000s	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	
Total investment needed \$000s							Total
Platform investment costs	(2,988.0)						(2,988.0)
Working capital needs	(50,8)	(75,4)					(126,2)
Operational losses/ shortfall	(929.9)	(1,792.8)					(2,722.0)
Investment	(2,335.0)	(2,133.2)					(5,846.2)

Area	Assumptions	Rationale	
Advisory revenues			
		<u>Year 0 Year 1 Year 2 Year 3 Year 4 Year 5</u>	
	Advisory		
	Strategy advisory, \$000s	\$140 \$287 \$441 \$753 \$1,081	<ul style="list-style-type: none"> Engagement value based on DinarStandard firm and team experience across strategic and operational advisory engagements. Number of projects based on reasonable penetration in support of Tier B Tier C, Tier D countries over 5 years, given IFC and World Bank engagement breadth.
	Number of engagements	2.0 4.0 6.0 10.0 14.0	
	Value per engagement	80.0 82.0 84.1 86.2 88.3	
	Low-tier value	46.4 47.6 48.7 50.0 51.2	
	Value growth %	2.50% 2.50% 2.50% 2.50% 2.50%	
	% low tier	30% 30% 30% 30% 30%	
	Low tier discount	42.0% 42.0% 42.0% 42.0% 42.0%	
	Operational and technical, \$000s	\$63 \$130 \$266 \$408 \$698	
	Number of engagements	1.0 2.0 4.0 6.0 10.0	
	Value per engagement	80.0 82.0 84.1 86.2 88.3	
Low-tier value	46.4 47.6 48.7 50.0 51.2		
Value growth %	2.50% 2.50% 2.50% 2.50% 2.50%		
% low tier	50% 50% 50% 50% 50%		
Low tier discount	42.0% 42.0% 42.0% 42.0% 42.0%		
Licensing fees			
		<u>Year 0 Year 1 Year 2 Year 3 Year 4 Year 5</u>	
	Platform licensing, \$000s	\$0 \$26 \$53 \$81 \$110	<ul style="list-style-type: none"> Number of registries based on a reasonable penetration of Tier D countries needed credit registries or bureaus established. Pricing is based on a benchmark of Microsoft database pricing, adjusted for greater complexity and customization needs¹.
	Number of registries leveraging OBIC platform	0.0 1.0 2.0 3.0 4.0	
	Licensing fee, \$000s	25.0 25.6 26.3 26.9 27.6	

¹ SQL Server 2017 Pricing, Microsoft. 2018. <https://www.microsoft.com/en-us/sql-server/sql-server-2017-pricing>

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5			
Database revenues	Cross-country database, \$000s			\$50	\$256	\$819	\$1,938	<ul style="list-style-type: none"> • Users benchmarked against Aman Union² users over three years, and Palestinian PCR³, with ramp-up based on scale of potential usage across OIC. • Low levels of subscription in earlier years, with ramp up expected. • Pricing benchmarked against D&B pricing, with lower pricing assumed for OIC countries. 	
	Number of total data users (e.g. banks, insurance companies)			500	2500	6000	12000		
	% buying subscription			25%	25%	40%	50%		
	% purchasing one off purchase			75%	75%	60%	50%		
	\$ annual per subscription			\$250	\$256	\$263	\$269		
	\$ one off spend/ annum			\$50	\$51	\$53	\$54		
	Number of inquiries transacted/ user			20	30	40	50		
Direct costs	Project direct costs, \$000s			\$81	\$125	\$198	\$314	\$445	<ul style="list-style-type: none"> • Project direct costs based on DS firm and team experience in project profitability. • Data acquisition costs based on expected usage of the database per user, with costs referenced against typical pricing charged by registries, which will be providing source data⁴.
	External direct costs as % of revenues			40%	30%	28%	27%	25%	
	Data acquisition costs, \$000s			\$8	\$53	\$144	\$375		
	Number of inquires transacted/ user/ year			20	30	40	50		
	Number of total users			\$500	\$2,500	\$6,000	\$15,000		
	Wholesale cost/ inquiry, \$			\$0.8	\$0.7	\$0.6	\$0.5		
Indirect costs – Personnel	Personnel costs	\$142	\$390	\$433	\$831	\$958	\$1,018	<ul style="list-style-type: none"> • Headcount and total cost referenced against World Bank guidelines⁵ on building a credit registry over five years, adjusted and customized for the Center's focus on several activities across geographies. • Average salary per head based on senior and junior staff costs across several GCC countries⁷. 	
	Headcount	2.0	7.0	8.0	16.0	19.0	20.0		
	Senior personnel	1.5	3.0	3.0	5.0	5.0	5.0		
	Management	0.5	1	1	1	1	1		
	Finance	0	1	1	1	1	1		
	Sales	0	0	0	1	1	1		
	Technology & IT	0.5	0	0	1	1	1		
	Business analysis	0.5	1	1	1	1	1		
	Junior & mid-level personnel	0.5	4.0	5.0	11.0	14.0	15.0		
	Admin	0.5	1.0	1.0	3.0	3.0	3.0		
	Finance	0.0	0.5	1.0	2.0	2.0	2.0		
	Sales	0.0	0.5	1.0	2.0	3.0	3.0		
	Technology & IT	0.0	1.0	1.0	2.0	4.0	4.0		
	Business analysis	0.0	1.0	1.0	2.0	2.0	3.0		
	Average salary per head, \$000s	71.0	55.6	54.1	52.0	50.4	50.9		
Senior personnel	\$84	\$86	\$88	\$90	\$93	\$95			
Junior personnel	\$32	\$33	\$34	\$34	\$35	\$36			
Wage inflation		2.50%	2.50%	2.50%	2.50%	2.50%			

2 Aman Union. <https://www.amanunion.net/>

3 Arab Credit Reporting Guide. IFC & Arab Monetary Fund. 2015. <https://www.amf.org.ae/sites/default/files/Research%20and%20Studies/Publications%20on%20AMF/en/Arab%20Credit%20Report%20Guide.pdf>

4 Credit Reporting Knowledge Guide. 2011: IFC.

5 Credit Reporting Knowledge Guide. 2011: IFC.

6 Cost of Doing Business in Bahrain. KPMG. December 2016. <http://bahrainedb.com/app/uploads/2017/06/KPMG-Cost-of-Doing-Business-in-Bahrain-Financial-Services-December-2016.pdf>

Indirect costs - Other	Technology , \$000s	\$0	\$420	\$420	\$420	\$420	\$420	<ul style="list-style-type: none"> • All other costs benchmarked against the guidelines for setting up a credit registry over five years. • Marketing costs have been assumed higher than the guidelines due to the center's need to incur higher costs to raise awareness and encourage usage of its OIC-wide capabilities.
	System hardware & software		\$185	\$185	\$185	\$185	\$185	
	Platform costs		\$235	\$235	\$235	\$235	\$235	
	Marketing, \$000s	\$0	\$102	\$148	\$203	\$206	\$230	
	Share of revenues		50.00%	30.00%	20.00%	10.00%	6.00%	
	Other operating costs, \$000s	\$0	\$140	\$150	\$160	\$172	\$184	
	Office utilities and other costs		\$90	\$96	\$103	\$110	\$118	
	Insurance, audit and other costs		\$50	\$54	\$57	\$61	\$66	
	Growth		7.00%	7.00%	7.00%	7.00%	7.00%	

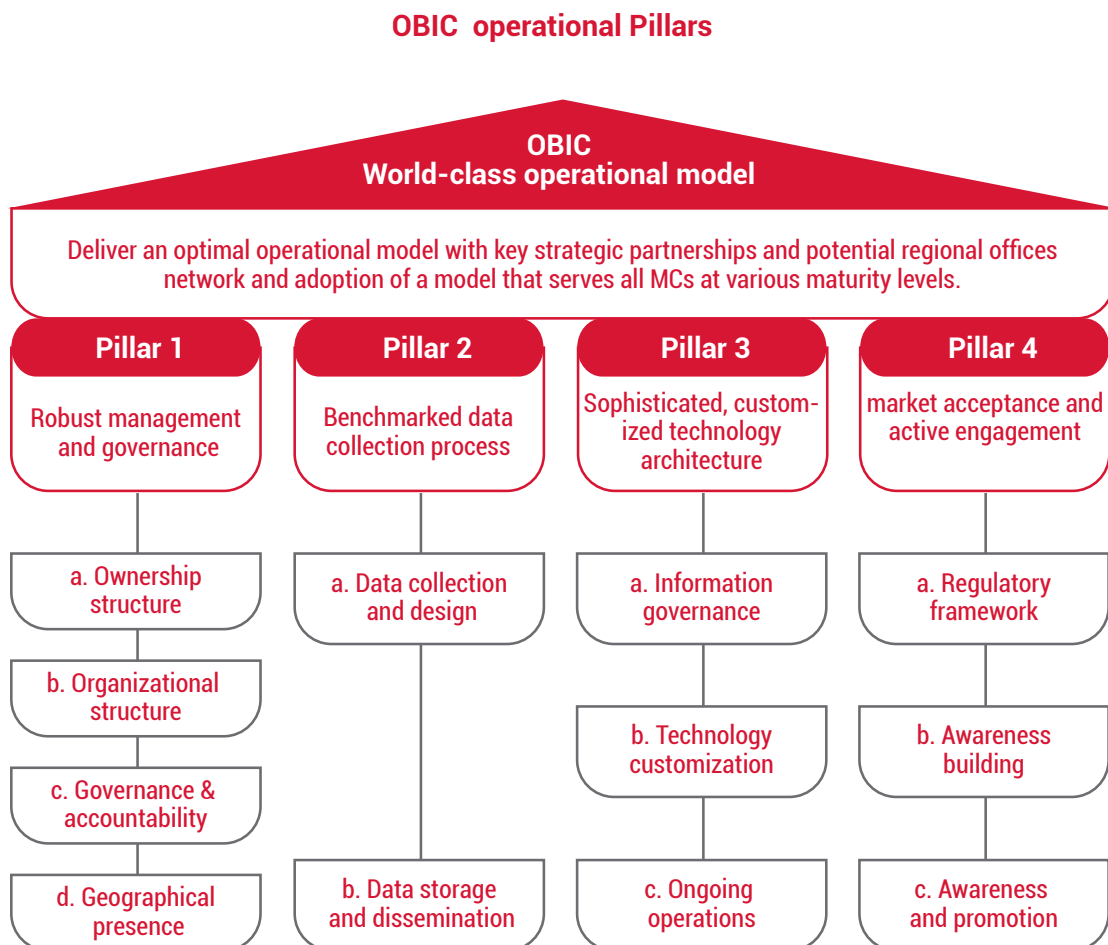
Operational Plan and

Consideration

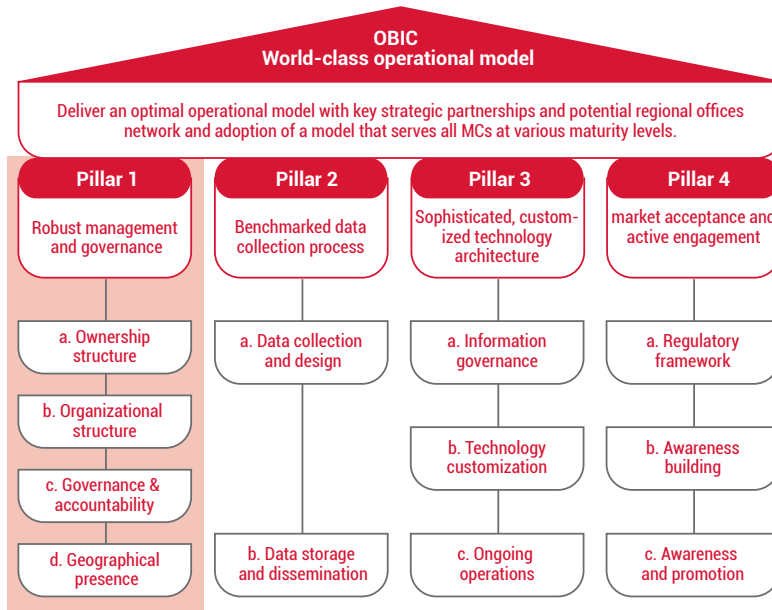


Operational Plan and Consideration

1. In order to deliver a world-class business intelligence offering that delivers on the center's core vision across the OIC, there are four key operational pillars that the Center must develop:



Operational Pillar 1: Robust Management and Governance



2. To enable its effective operation, governance and broad accountability, OBIC will be owned by a consortium of member countries and overseen by an executive board representing key stakeholders from MCs and associated multilateral bodies.

a) Ownership structure

3. The OBIC will be multilateral entity, overseen by COMCEC, but owned by a consortium of select member countries.
4. While membership may change over time, ownership should initially be apportioned across each of the tiers of credit maturity, with greater initial weight to Tier A and Tier B countries, who will be in a stronger position

initially to support the development of a cross-country database.

5. Ownership should be accounted in the form of subscription capital, with shares issued in return for funding paid by each of the MCs.
6. The owners should comprise a mix of central banks and public credit registries, with no direct ownership by financial institutions to avoid conflicts of interest. As a guideline:
7. Refer to the market analysis section of this report (Part d)¹
8. for a detailed list of OIC MCs by tier of credit maturity.

Illustrative ownership structures, by tier of credit maturity

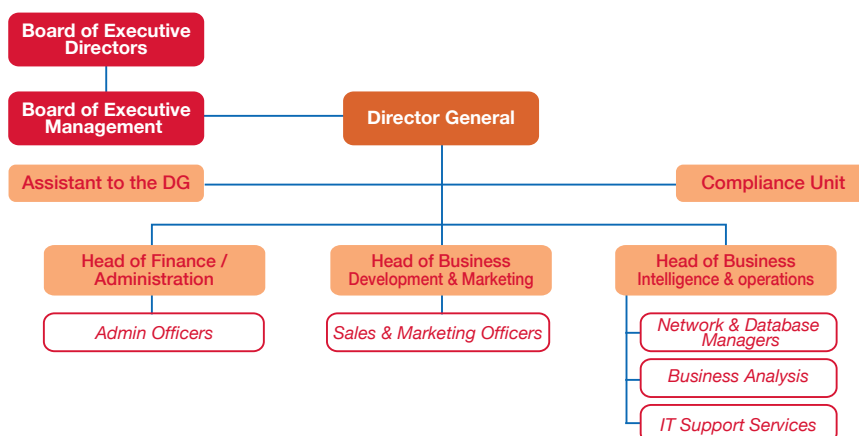
Category	Ownership %	Ownership entities
Tier A	30%	<ul style="list-style-type: none"> • Ministries of Finance • Central Banks • Existing credit registries
Tier B	30%	
Tier C	25%	
Tier D	15%	

¹ Under the section on OIC Credit Intelligence Ecosystem Gaps and SWOT Analysis

b) Organizational structure

9. The organization will be overseen by an executive board comprised of stakeholders from MCs, ICIEC, SESRIC and ICDT, with robust executive management, business development, marketing and technical functions.

Proposed organizational structure for OBIC



Core function	Constituents	Core remit (based on World Bank ²)
(1) Board of Executive Directors	Chairman Members of the Board: <ul style="list-style-type: none"> • ICIEC representative • ICDT representative • SESRIC representative • <Other members nominated by MCs> 	<ul style="list-style-type: none"> • Oversee and approve the strategic direction of OBIC • Provide policy oversight to enable implementation of the business plan • Appoint Director General • Provide close oversight of the Board of Executive Management
(2) Board of Executive Management	<ul style="list-style-type: none"> • Chairman –ICIEC representative • Director General (to be determined) • Representatives from central banks, ministries and public policymakers • Representatives from ECAs (2 by each Regional Hub) • Representatives from private sector (2 from each regional hub) • 3 Representatives of voluntary 	<ul style="list-style-type: none"> • Oversee the delivery of OBIC Strategic Plan • Implement and oversee all organizational, legal and compliance aspects of OBIC operations
(3) Day-to-day Management	Director General Assistant to the Director General	<ul style="list-style-type: none"> • Delivery of overall OBIC Strategic Plan
	Compliance	<ul style="list-style-type: none"> • Internal process audit • External compliance • Oversee data quality and dispute resolution process
(4) Finance and Administration	Head of Finance and Administration Admin officers	<ul style="list-style-type: none"> • Finance and administrative operations • Human resources functions (recruitment, compensation, performance management, career development)

(5) Business Development and Marketing	Head of Business Development and Marketing	<ul style="list-style-type: none"> • Market segmentation • Product development • Branding • Advertising and Sales
	Sales and Marketing Officers	<ul style="list-style-type: none"> • Client relationships • Sales and marketing plan • Promotion • Market research • Media affairs
(6) Business Intelligence and Operations	Head of Technology	<ul style="list-style-type: none"> • Vendor relations • Data management • Technology management • Network and database security operations • Customer services
	Network and database managers	<ul style="list-style-type: none"> • Data validation and quality checking • Data uploading • Emergency updates
	Business analysts	<ul style="list-style-type: none"> • Database design and user functionality • Data sourcing • Data procurement and access partnerships
	IT support	<ul style="list-style-type: none"> • Housekeeping • System administration • Subscriber and internal Help Desk

c) Governance and accountability

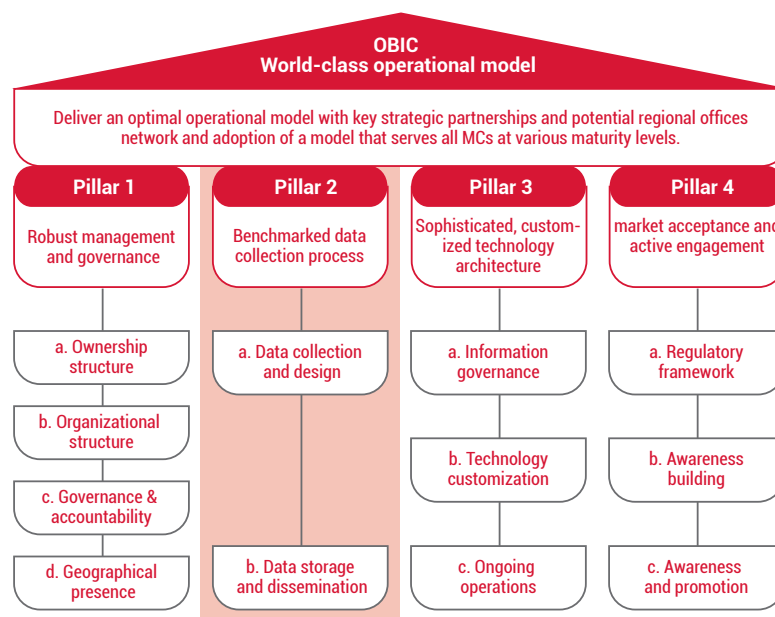
- OBIC will be established by the recommendation of COMCEC and will hence be governed by the same financial and legal provisions and procedures of exiting entities under COMCEC.
- The organizational structure, as set out earlier, will add an additional layer of oversight, with the Board of Executive Directors overseeing OBIC progress against its objectives.

d) Geographical location

- The OBIC should have a robust representation across the OIC, with its head office in a Tier A country, ensuring a distributed geographic presence, as well as across each of the identified tiers of credit maturity.

Office	Location recommendation
Head Office	Tier A country (with a preference for the MENA region)
MENA Office	Tier C country
Central Asia Office	Tier B country
Sub-Saharan Africa Office	Tier D country
South East Asia Office	Tier A country

Operational Pillar 2 – Benchmarked Data collection process



13. OBIC, in particular through its cross-OIC database, but also in promoting best practices, will follow a leading process for collecting and disseminating data.

a) Data collection and design

14. In collecting and packaging the relevant data for various subjects in its cross-OIC platform, OBIC will perform the following activities:

Legal protocol

15. OBIC will push for legal data sharing agreements that may be part of an expanded trade agreement between MCs, and will allow for the collection and dissemination of certain types of data, and that will provide the legal operating framework for OBIC team of analysts.

Data collection and sanitization:

16. Data will be pooled from different sources of all stakeholders (central banks, credit bureaus, export credit agencies, ministries, IPAs, chambers of commerce & industry, business associations, rating agencies, and specialized agencies) as well from accessible general data
17. A partnership with the Aman Union Database will enable rapid build-up of trade partnerships and pertinent negative information.
18. OBIC will be able to screen intelligence information through a battery of BI platforms, supplemented by broad scans of news articles.

Data packaging

19. OBIC will create a standardized report that spans critical information, including: company name, existing

financial commitments and loan history, negative reporting from trade partners, revenue estimates, and key management, with the scope of such reports expanded to include other sources of alternative data as the platform scales and matures.

b) Data storage and dissemination

Data storage and accuracy

- Data will be kept securely on OBIC platforms, with extracts of the data shared with users' subject to clear agreements on how the data can be used, with limitations of sharing such data with external parties.
- Business analysts will routinely update the data, including a manual check of data that is requested for purchase by external users, a process that can be automated as the system scales.

Dissemination

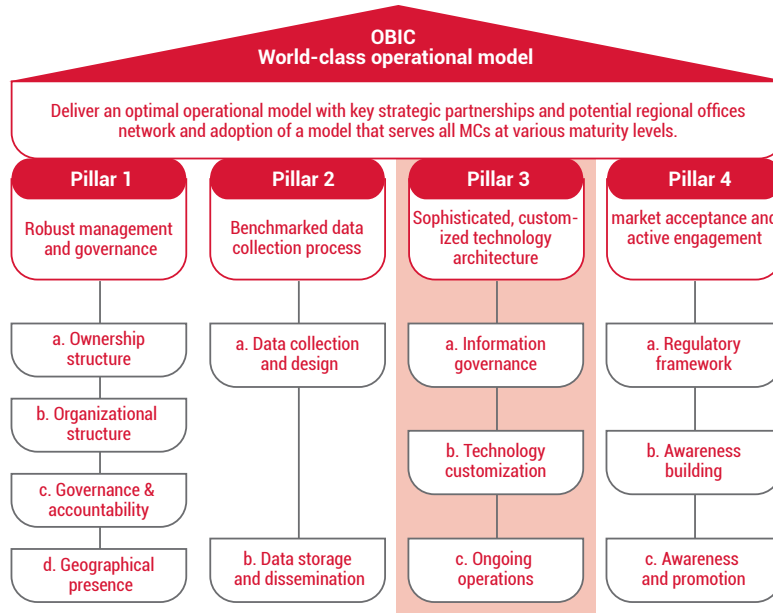
- Data will be disseminated electronically via a website, subject to clear agreements on data access and usage, with a rapid response time. Given 58% of credit bureaus provided requested data instantly according to the World Bank, OBIC should aspire to promptly deliver or deliver over very short times (1-2 hours)³.

Disputes

- Data subjects should have a mechanism through which they can challenge any information reported about them on OBIC database.

³ Credit Reporting Knowledge Guide. 2011: IFC.

Operational Pillar 3 – Sophisticated technology



- 20. OBIC will develop a new technology platform – one that can be leased to other MCs and one that can provide cross-country data to facilitate trade.

a) Information governance

Defining information governance

- 21. Information governance, or IG, is usually defined as the management of information at an organization. Information governance balances the use and security of information, and it helps with legal compliance, operational transparency, and reducing expenditures. An organization can establish a consistent and logical framework for handling data through information governance policies and procedures. These policies guide proper behavior regarding how organizations and their employees handle electronically stored information (ESI).
- 22. Information governance encompasses more than traditional records management. It incorporates information security and protection, compliance, data governance, electronic discovery, risk management, privacy, data storage and archiving, knowledge management, business operations and management, audit, analytics, IT management, master data management, enterprise architecture, business intelligence, big data, data science, and finance.

Implementation of the IG at OBIC: Benefits of Information Governance

- 23. While regulatory compliance or litigation activities are often the spur for initiating Information Governance, there are a wide range of benefits for any institution that implements the Information Governance.
- 24. These include the tangible cost savings from better IT and information storage utilization when the unnecessary data is removed from corporate systems. Information Governance will not only identify information that has no value to an organization, but also the systems and storage media that are no longer required for processing or managing that data.
- 25. Increasingly, many organizations are focusing on the business agility and profitability benefits of an effective Information Governance program. By clearly understanding the value of the information you have and setting in place the processes and procedures to securely access it when and where required, an organization can unlock the potential of their information in areas such as business analytics and collaboration.

Importance for OBIC

- 26. While information governance is an emerging field as it pertains to business, trade, finance and investment, all of those areas have all embraced information governance strategies to manage the copious amounts of data relevant to their work. So new, in fact,

are approaches to information governance strategies in those sectors made efforts to set a series of principles and guidelines based on the integrity, protection and retention of business information to adopt.

27. Accordingly, once the OBIC is launched and fully operationalized, it is expected to set and implement its own information governance guidelines that goes along with the best practices in the industry, and when the environment is made ready, it is expected that the utilization of BI information by MCs will grow significantly, continuing on an exponential growth path. For the enterprise, there is an obvious growth of content within the firewall in email, file systems, corporate systems, with their different types, including hard copy versions. At the same time, there is also an explosion of high-value content outside the firewall, in wikis, blogs, social commentary, and customer interactions.
28. In some areas, issues of access from MCs to information are impairing the business. In this regard, systems that rely mainly on paper are a prime example and may still exist in many organizations, but when information is dispersed and copied across many environments, it becomes increasingly challenging to collaborate on this information, difficult to ensure access to the latest version of content, and impractical to automate processes.
29. There is also value in understanding data collected from MCs and turning content into meaningful enterprise information and this could be used for business optimization. When information is brought together in standard processes, analyzed, categorized and understood, that information can drive significant insight and competitive advantage.
30. As a practical example, let us consider the case of an international firm bidding on a large capital project. Creating a response to the tender can be recreated from scratch or reused from previous projects. If information from similar projects is understood and can be easily reviewed and assembled, then the response to the tender demonstrates the experience held by the organization and offers a significantly higher chance of success.

b) Technology customization

Database scale

31. Given the expected usage of the database, both by MCs and across the OIC, and referencing the projections in the next section, there could be over 50,000 regular users within 5-10 years. Accordingly, the full-stack design of the database needs to account for scale at multiple levels:

- The back-end design must allow for the creation of over 100,000 records, which may be developed over time, with a simple user interface to allow for data inputting
- Robust automation functions must be incorporated that leverage machine learning and allow for the translation and packaging of data from multiple sources into a standardized, OBIC-approved format
- End-user features, across internet and mobile, must be clearly tested and intuitively designed, with paywall functionality to ensure instantaneous download

Siloed database

32. Given that the technology will be licensed to select Tier C or Tier D countries to build individual databases, data security must be in-store data on local servers and prevent such data being accessible outside of the designated country. Such data explicitly must not be mistakenly shared and made accessible on the cross-OIC database.

Data security and next-generation capabilities

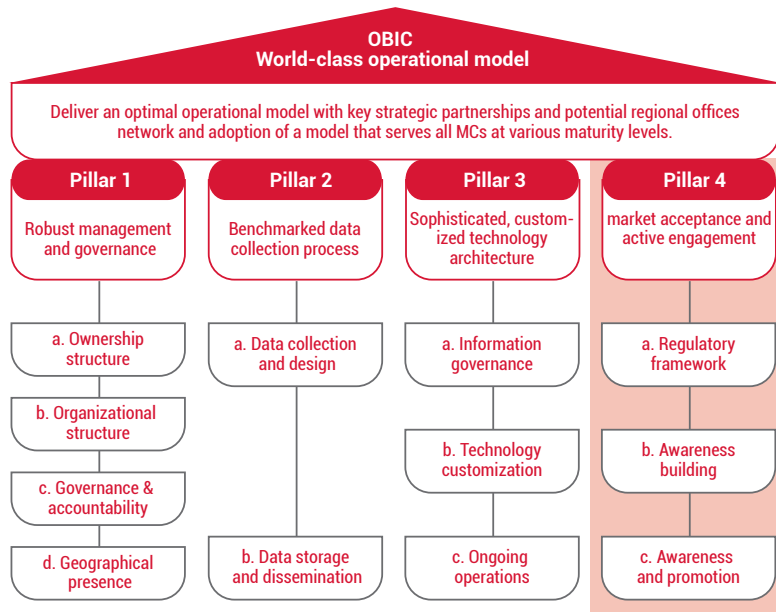
33. The database will require critical security features to ensure confidential information is stored correctly, with the risk of loss, tampering, theft and carefully managed, and with regular reviews of data security, emphasizing the following:
 - Monitoring and tracking access to the database
 - Restricting access to registered, approved users
 - Incorporating cyber-security features in the database
 - Maintaining a back-up database
34. Blockchain will be an important application to protect the integrity of the data, ensuring that the storage of any collected data is decentralized and cannot be altered or modified. Manual access to a blockchain-based system can be provided to privileged employees, but the automated collection and integrity of collected data will be ensured.

c) Ongoing requirements

35. The technology of the database will require continuous updates, allowing for scale-ups, with important improvements made over time to the usability of the database, both on the back end, as well as for end users. Accordingly, the employment of an in-house technology team will be critical to the efficient functioning of the Center.

Operational Pillar 4 – Market acceptance

36. Gaining market acceptance will be critical for the OBIC in securing the usage of its cross-country data platform, which in turn will drive enhanced trade across the OIC. Accordingly, engaging of stakeholders will be critical to the success of the Center.



a) Establish and advocate for a robust regulatory framework

37. OBIC core role as it seeks to drive credit maturity and trade across the OIC is in advocating for streamlined regulation across the OIC markets, with the following key areas of prioritization.

Promoting a friendly legal framework for data sharing within countries across the OIC

38. Bank secrecy is considered a major constraint in particular in the MENA region, with lenders concerned about sharing customer data at the risk of incurring criminal charges. There is a strong need for a common, harmonized framework, covering critical areas such as licensing criteria for investors and operators, limits on data lifecycle and access, and clarity on consumer rights, including accessing data and permission to use data⁴.
39. OBIC core role would be to draft important white papers on the topic and lead efforts to harmonize regulations.

Ensuring broad coverage of various stakeholders, including SMEs and microfinance clients

40. OBIC should advocate for all MCs to adopt a code of conduct for private credit registries, that paves the way for an eventual establishment of private credit bureaus across the OIC, alongside public credit registries.
41. The code of conduct, which should eventually be codified into law, should comprise the following:
- A framework for obtaining the consent of data subjects, including consumers and businesses⁵.
 - The allowance of non-traditional data, such as utility records or microfinance loans, to allow small- and-medium-sized businesses, as well as low income consumers, to establish a credit record⁶.

Promoting a friendly legal framework for data sharing within countries across the OIC

42. Having a framework for cross-data sharing is fundamental to the OBIC objective of boosting intra-OIC trade. Given the fact that OBIC seeks to obtain

4 Madedu, Oscar. The Status of Information Sharing and Credit Reporting Infrastructure in the Middle East and North Africa Region. June 2010. http://siteresources.worldbank.org/INTMNAREGTOPPOVRED/Resources/MENAFlagshipCreditReporting12_20_10.pdf

5 Madedu, Oscar. The Status of Information Sharing and Credit Reporting Infrastructure in the Middle East and North Africa Region. June 2010. http://siteresources.worldbank.org/INTMNAREGTOPPOVRED/Resources/MENAFlagshipCreditReporting12_20_10.pdf

6 Credit Reporting Knowledge Guide. 2011: IFC.

critical data from existing registries and bureaus and to make that data available to counterparts across the OIC, the following steps are needed:

- The signature of a clear memorandum of understanding between OIC countries to facilitate and support the sharing of select data in order to ensure critical information sharing.

- Ultimately, a data-sharing pact that sets out the core parameters of data required, the subjects, and the end users⁷.

Key business development partnerships & engagement approach

- Partnerships will be critical to OBIC for establishing a viable and scaled operation. Partners must comprise a mix of global and OIC-based entities.

1. Global entities

Institutions	Entity	Value to OBIC	OBIC value proposition
Multilateral organizations	World Bank	Experienced partner who can support the execution of high impact consulting engagements and support the development of best-practice guidelines.	Offers access to key stakeholders across OIC MCs; provides opportunity to be part of a groundbreaking, ambitious cross-country project.
Technical advisors	Path Solutions	Deep technology design capabilities; can support on project implementation.	Access to MCs and participation in ambitious cross-country project.
Technology partners	Consensys	Blockchain technology venture studio that can help ideate next-generation credit reporting system.	Viable, scalable use of the Ethereum technology that Consensys has developed.
	Path Solutions	Leading software provider to Islamic finance institutions that can help build and operate the fundamental technology platform.	
	Finterra	Blockchain technology company that currently works with Islamic Finance institutions and can help develop a next generation credit reporting database for OBIC.	
Operational partners	Experian	Supports the direct operation of new credit bureaus in Tier C and D countries, leveraging its proven hub and spokes model.	Supports Experian's expansion across the OIC.
	D&B	Advise on the creation of a cross-country model.	Valuable high-impact advisory opportunity for D&B.

⁷ Ibid

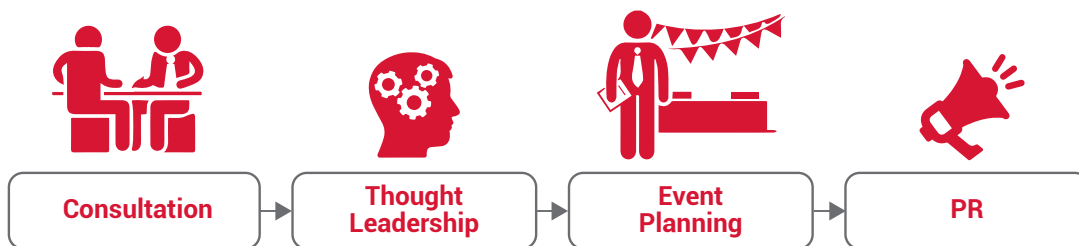
2. OIC-based entities

Institutions	Entity	Value to OBIC	OBIC value proposition
Multilateral initiatives	Aman Union	Access to the existing database as a source of information, including buyers, and core advisory support on how to set up a database. Marketing and promotion among Aman Union users and stakeholders to build market credibility.	Reciprocal support for the ongoing development of AMAN Union as a supporting pillar of OBIC ambitious cross-country data sharing objectives.
OIC CRSPs and regulators (ideally across)	Private Bureaus	Direct clients of OBIC Advisory practice. Access to critical data to build a credible cross-country database.	Supporting the scaling and maturity of CRSPs across the OIC, including the adoption of best practices.
	Public registries	Marketing and promotion support to adopt the database.	
Operational partners	Experian	Supports the direct operation of new credit bureaus in Tier C and D countries, leveraging its proven hub and spokes model.	Supports Experian's expansion across the OIC.
	D&B	Advise on the creation of a cross-country model.	Valuable high-impact advisory opportunity for D&B.

b) Marketing and promotion activities

44. In addition to undertaking critical partnerships that will underpin market acceptance of the OBIC, it is essential for the new center to raise awareness.

Core marketing activities



a) Industry consultation

45. Once OBIC is established, there should be consultations held with private lenders and financial institutions from across the core regions, representing each tier of credit maturity, to ascertain:
- Key concerns and considerations
 - Use cases and existing constraints, in particular to an OIC-wide database, and
 - Impediments to adoption

b) Establishing OBIC thought leadership

46. The OBIC can establish thought leadership by issuing reference material for the credit community across the OIC, with the following core pieces:
- **Annual report** on the state of credit reporting and trade in the OIC, which could be co-authored with the Islamic Development Bank Group. This would be circulated to all major stakeholders, central banks, credit registries, credit bureaus and major financing institutions.
 - **Best practices guidebook (updated every ~2 years)**, made available to all stakeholders, on how to establish, run and support the development of credit reporting, tailored to the OIC.
 - **Monthly newsletter** – a newsletter available to all MCs' central banks, credit registries and bureaus, and leading financial institutions, on key developments in credit reporting around the world.

c) Planning convening events

47. OBIC would play a leading role in convening significant events on credit reporting, with the following:
- **Annual roundtable** with industry leaders from the MCs to discuss credit reporting developments and priorities, to coincide with scheduled COMCEC meetings.
 - **Industry networking events, held once annually**, bringing together financial institutions and trade entities across the OIC, to facilitate and promote partnerships and to promote the cross-country database.
 - **Training events** on a quarterly basis to provide essential training on best practices, database usage and emerging technologies. To be delivered online and offline.

d) PR and direct outreach to raise the profile and usage of OBIC extensive services

48. The following core activities will help OBIC establish a broad user base:
- **Active web and social media presence** – effective leveraging of website, Twitter and other social media to ensure a robust following of professionals is developed, with active engagement and awareness of OBIC.
 - **Active business and proactive proposal development** – targeted outreach of MCs with the greatest need to enhance or develop their credit reporting ecosystems, notably Tier C or Tier D countries.
 - **Advertising and announcements** – print and online advertising to promote the OBIC, in particular, the cross-country database once launched – to drive usage.

OBIC

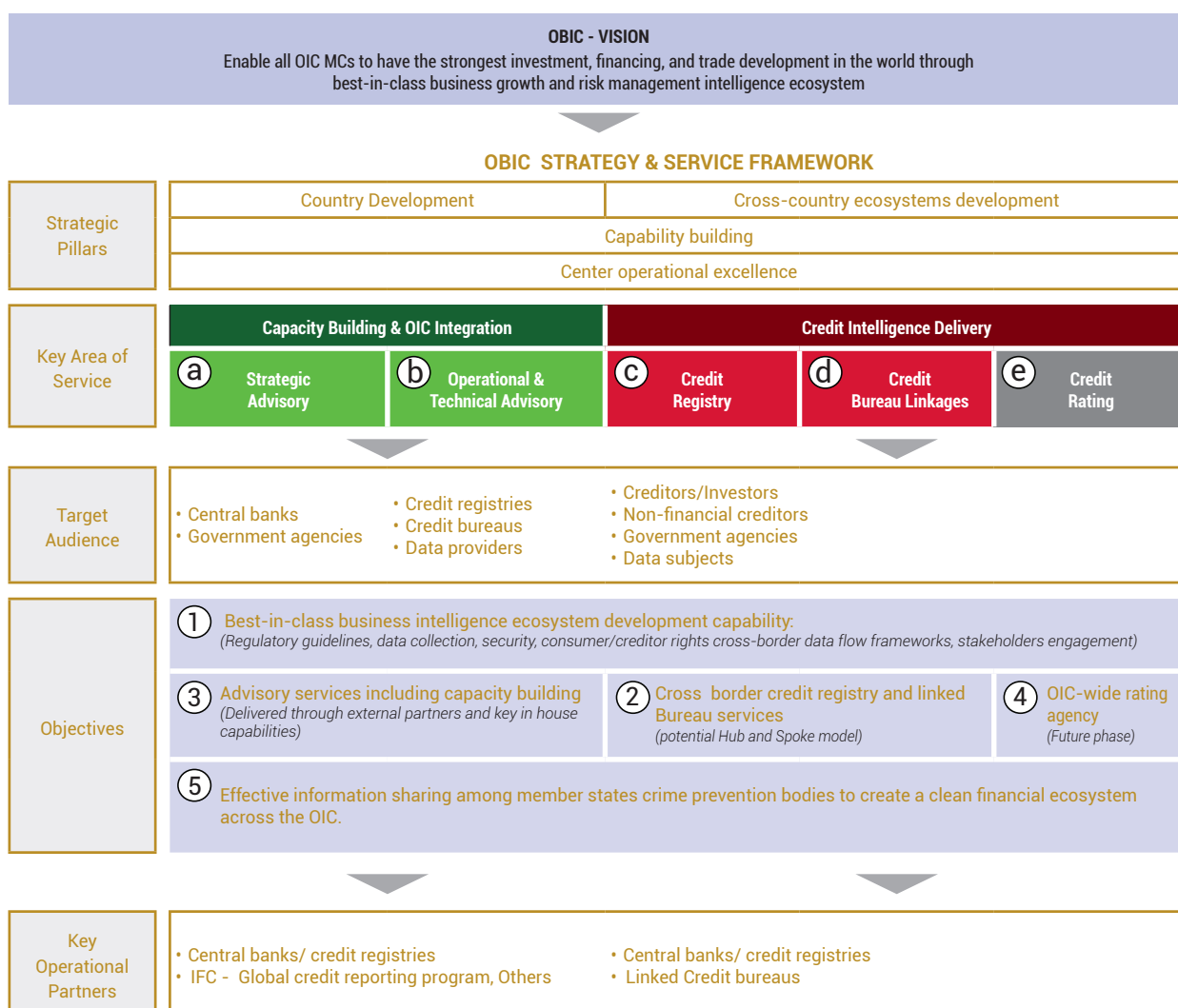
Project



I. OVERVIEW

1. To accomplish its vision of enabling all OIC MCs to have the strongest investment, financing, and trade development in the world, the OBIC will be establishing best-in-class business growth and a sound risk management intelligence ecosystem.
2. Clear credit information is a requirement for such eco systems to promote sound risk management and financial stability.
3. In fact, Creditors draw on credit reporting systems to screen borrowers and monitor the risk profile of existing loan portfolios. Moreover, the OIC will rely on credit information to understand the interrelated credit risks faced by systemically active regional borrowers and financial institutions and to conduct essential advisory functions.

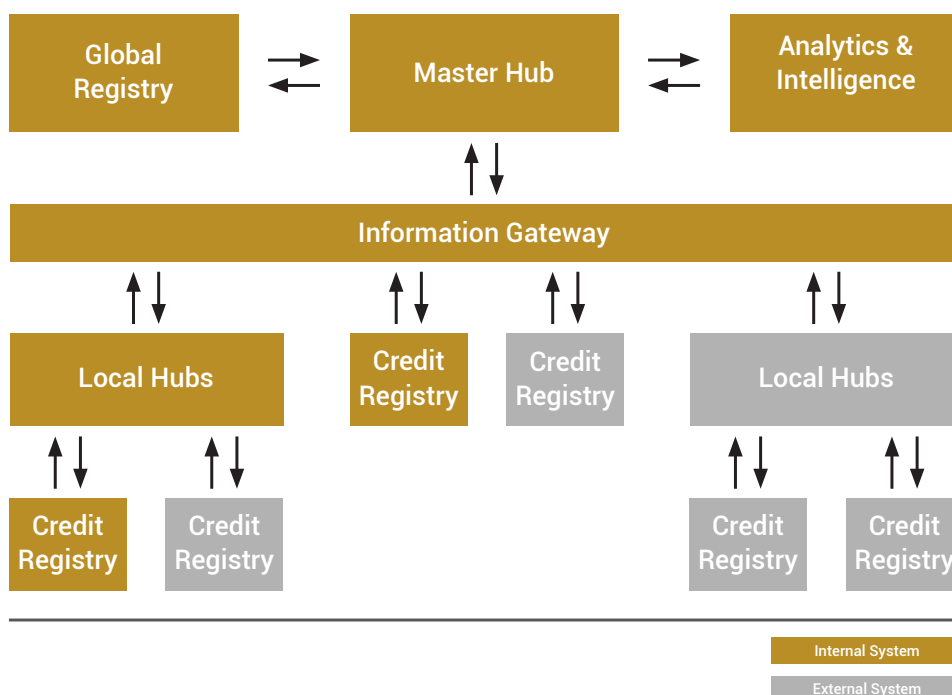
Vision, Services Framework , Strategic Objectives of the OBIC



4. In order to build capacity across the OIC, ICIEC will provide a full consultancy program for tier C and Tier D countries providing both functional and technical advisory on setting up a credit registry as well as a fully operational credit registry infrastructure to enable them to gather information and maintain it, while producing required basic reports.
5. On the Credit intelligence delivery side, the credit bureau linkage Global Registry leading to Master Hub that will service Governments, Creditors and Investors by providing detailed cross country company reports, Market and research reports, as well as Credit ratings expanded below:
 - The company reports will help creditors take day-to-day credit decisions, analyze a company's financial strength and discover commercial opportunities. They would be able to verify that a business exists in a different geography and check its size and purpose as well as understand past payment behavior and financial stability. The reports will also allow them to check ownership details, legal information and historical financial information.
 - Market and research reports will provide industry outlook with market size assessment to enable better informed decisions for new projects and potential new business.
 - Credit ratings will be derived from the same environment leveraging the platform technologies to enable analysts to derive multiple scores on company, industry and country levels such as credit scores.
6. This information is crucial whenever a company is seeking a loan or other financing, bidding on contracts, investing in other companies and more.

II. BUSINESS ARCHITECTURE

7. The key business areas of service are:
 - a. Strategic Advisory
 - b. Operational and Technical Advisory
 - c. Credit Registry
 - d. Credit Bureau linkage
 - e. Credit rating
8. The proposed solution for the above comprises of 5 main components that will allow data subjects to connect to data providers efficiently, even with cross country barriers.



Master Hub

9. The central component of the proposed architecture is the "Master Hub". It is the modeled data repository that hosts Credit registry data collected from every commercial borrower in the banking system. The data contain identification information and financial information as described below:

Company information

10. Each company has a record showing its Official Registered Name in Arabic/English, the Trade Name, Business Activity, operating sector as well as Enterprise size, Number of employees, the scope of business etc...

Company history

11. Information on the Legal Form of the company, its date of Date of Incorporation as well as the country of incorporation are available. Each manager or executive will have his own information such as education, business background, control date, and more.

Public records

12. The history also includes past legal proceedings for the company and its owners as well as any data obtained from the public records of the different government agencies such as Judgements, bankruptcy, tax liens, foreclosures, Data of judgments, liens or lawsuits including the status and more details when available.

Connections

13. The shareholder information as well as any other cross country connection identified from the cross country registry is available in this data store. This includes Parent company, Headquarters, Branches, Subsidiaries, Divisions and Affiliates. For each connection, Connection types, Connection status and other details such as % of holdings are also available showing the entire family tree of each company when data is available.

Inquiries

14. Every time a request is sent for information on a company's credit report, a record is made with details of date and requester.

Balance sheet information and financial ratios

15. The Financial statements, typically a snapshot of the last 3 years, including balance sheet and income statement data, in addition to key financial ratios such as profitability, solvency, efficiency etc....

Credit facilities and Payment History

16. This is the most significant information collected. The data includes the vital characteristics of each loan such as detailed historical information of credit facilities acquired by the borrower, limits, terms of payment, and any other positive or negative experience, such as:
 - Type of liability of the borrower, i.e. the commitment the borrower has vis-à-vis the credit institution and type of the loan
 - Status of the loan to indicate if there is any degree of non-compliance with the repayment schedule (e.g., drawn credit in a regular situation, undrawn credit, overdue loans, written-off loans).
 - Details on creditor

- Date Opened and date of last activity
- Original and residual maturity identified according to a list of predefined brackets
- Amount and Currency of the loan.
- Maximum balance
- Number of days the loan is past
- Details on collateral or guarantee securing the loan
- Identification of special characteristics associated to loans
- Value of monthly repayments, Minimum payment due and Amount of last payment

Credit scores

17. Credit scores will be derived from the Analytics and Intelligence component, including individual credit scores and benchmarks against industry/country averages.

Global Registry

18. The global registry is an independent data repository that will be updated regularly with Company ownership data gathered from the different international sources such as public records and commercial registries.
19. Unique identifiers will be provided to each entity and connections will be managed using specific indicia as well as machine learning algorithms. Family trees will also be drawn at this level for tracking relationships between different entities and allowing full view of each entity.
20. This registry will be accessed on each request for information to identify potential connections with the request subject.

Analytics and Intelligence

21. Analytics features enable the OIC use its Master Hub data for a variety of purposes, namely:

Credit scores:

22. The information gathered in the master hub is used to create a credit score which most lenders would use as criteria for approving new loans. Credit scores will be assigned to each company according to best practice models customized to each market.
23. The credit scoring models can be traditional scorecard models or advanced complex models and will be processed and updated periodically.
24. Predefined sets of financial ratios are also calculated, including core ratios and supplementary indicators of company's risk profile, profitability and leverage such as Debt to EBIDTA, Gearing ratio and return on capital.

Statistics and Market reports

25. Market reports help banks, financial institutions and investors perform feasibility assessments for projects prior to funding. The reports track multiple indicators from technical and financial perspective all while considering the industry status.
26. This will compile very comprehensive statistics on credit, with breakdowns by institutional sector of the borrower,

branch of activity, purpose, size of the firms, location/region and amount of credit in order to better assess credit concentration and distribution, measure overdue loans and overdue loans' ratio and understand the risks in the industry.

27. These reports will also include analysis of distribution measures by loan/debtor classes according to the activity sector, exposure size, firm size, type of guarantee, performing status and other characteristics.
28. Data can be broken down by multiple dimensions and drilled down to lower levels of information with tractability features.
29. These reports will be requested for specific projects and will be tailor made to fit the project needs.

Information Gateway

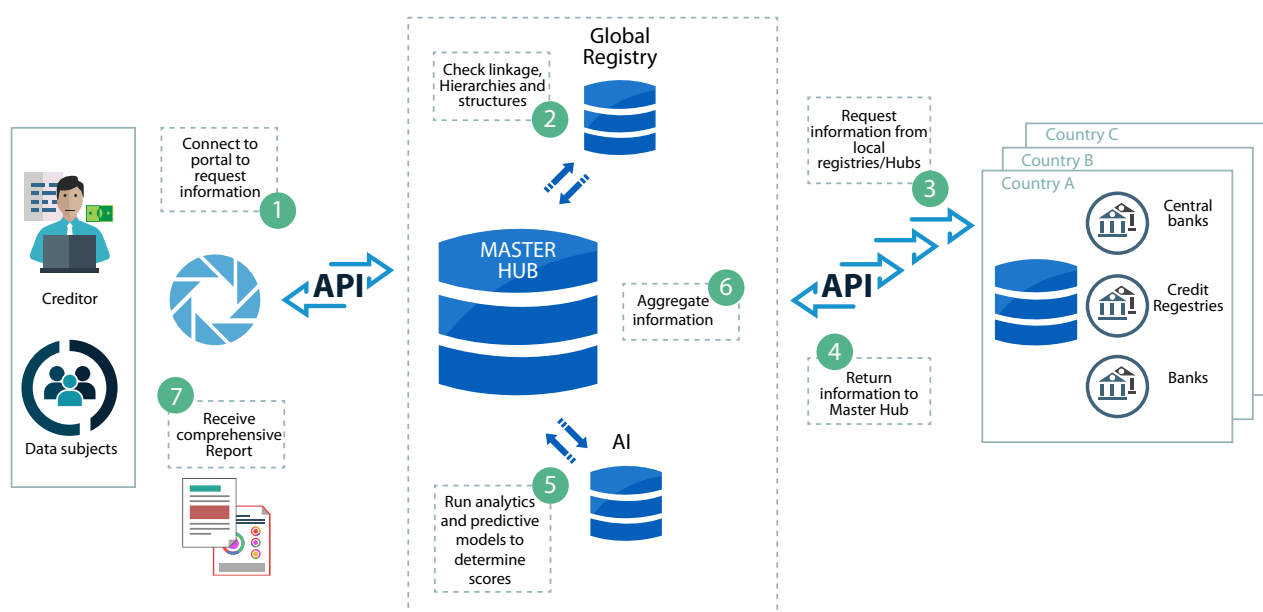
30. The information gateway is used to broker information between the OIC ecosystem and external systems, it includes the portal where registrations will take place, users will be managed and requests will be processed.

Local Hub

31. The local hub is a simplified version of the master hub, it is a standard database that can be deployed either as a hub or as an independent credit registry to serve the purposes of the OIC in:
 - Providing strategic and operational advisory
 - Establishing local credit registries

III. INFORMATION ARCHITECTURE

32. Information will flow automatically between the different components, as per the below diagram:



Request for Information

33. Registered subscribers (Creditors or data subjects) can log in to the information gateway portal and request information on a particular company. They will input minimal information for the company's name, country as well as any other relevant information.

Check against Global Registry

34. Once the request is made, the system automatically checks this company data against its global registry. At this stage, the company itself is identified as well as its family tree if available.

Send Requests for Information

35. Depending on the number of connections identified in step 2, one or multiple requests will be sent to the different local registries. These registries will either be hubs owned and operated by the OIC or other credit registries providing data through data sharing agreements.

Perform analytics

36. At this level, previously established scoring models will be run automatically to determine the credit scores and the key performance indicators. Available Industry data will be also leveraged to determine industry averages to benchmark the requested company's data against.

Aggregate information

37. Information on borrower gathered from the different registries, as well as family tree, and analytics and scores will be gathered in the Master Hub and stored in the appropriate location.

Disseminate report

38. The automatic process will deliver the full report to the requester.

IV. DATA ARCHITECTURE

39. This section will describe the general approach that will be adopted to establish the OBIC data architecture to ensure that the information can serve the designated purpose of OBIC to do proper analysis of the cross country credit information.

Bottom-Up Approach

40. Any modern EDW comprises of multiple levels of informational needs, with the capacity to answer any given inquiry the consumers may have. To achieve OBIC will be built using a bottom-up approach, meaning, the data will be gathered and ingested into a centralized data repository first, then processed for inquiry-handling later. This would ensure that the EDW will have all the data needed for any inquiry OBIC consumers may have.

Modeling

41. Traditional data warehouses follow the deductive modeling approach, causing the data model to be rigid in nature. The approach followed in traditional data warehouses is to structure data, ingest it, and then analyze it. The modeling approach OBIC will adopt will be to ingest data, analyze it, then structure it, i.e. inductive modeling approach. This would require the system to adopt the schema-on-read approach.

Diversity of Sources

42. Sources of information are rarely in the format the end-users desire. Some sources of data may be stored in relational systems, others in semi-structured formats like XML and JSON. However, knowing that 80% of data worldwide is unstructured in nature, a modern EDW must cater for the storage and processing capabilities of such data. Accordingly, the approach that will be adopted in OBIC is to hold a storage system that is capable of ingesting data of any structure.

Scalability

43. Sizing is a main challenge any BI solution since it has to properly specify the hardware needs in terms of memory (RAM), storage (disk), and processing (CPU). Previously, systems were deployed on previously sized single server machines. This approach leads to issues when the business expands in terms of data size or processing needs. Accordingly, the market trend is to adopt a scalable system that can scale up or down on need by adding commodity-grade servers to a cluster of servers. The OBIC will be designed in a way that each layer will support scaling up by adding nodes to the separate groups of clusters.

Predictive Analytics

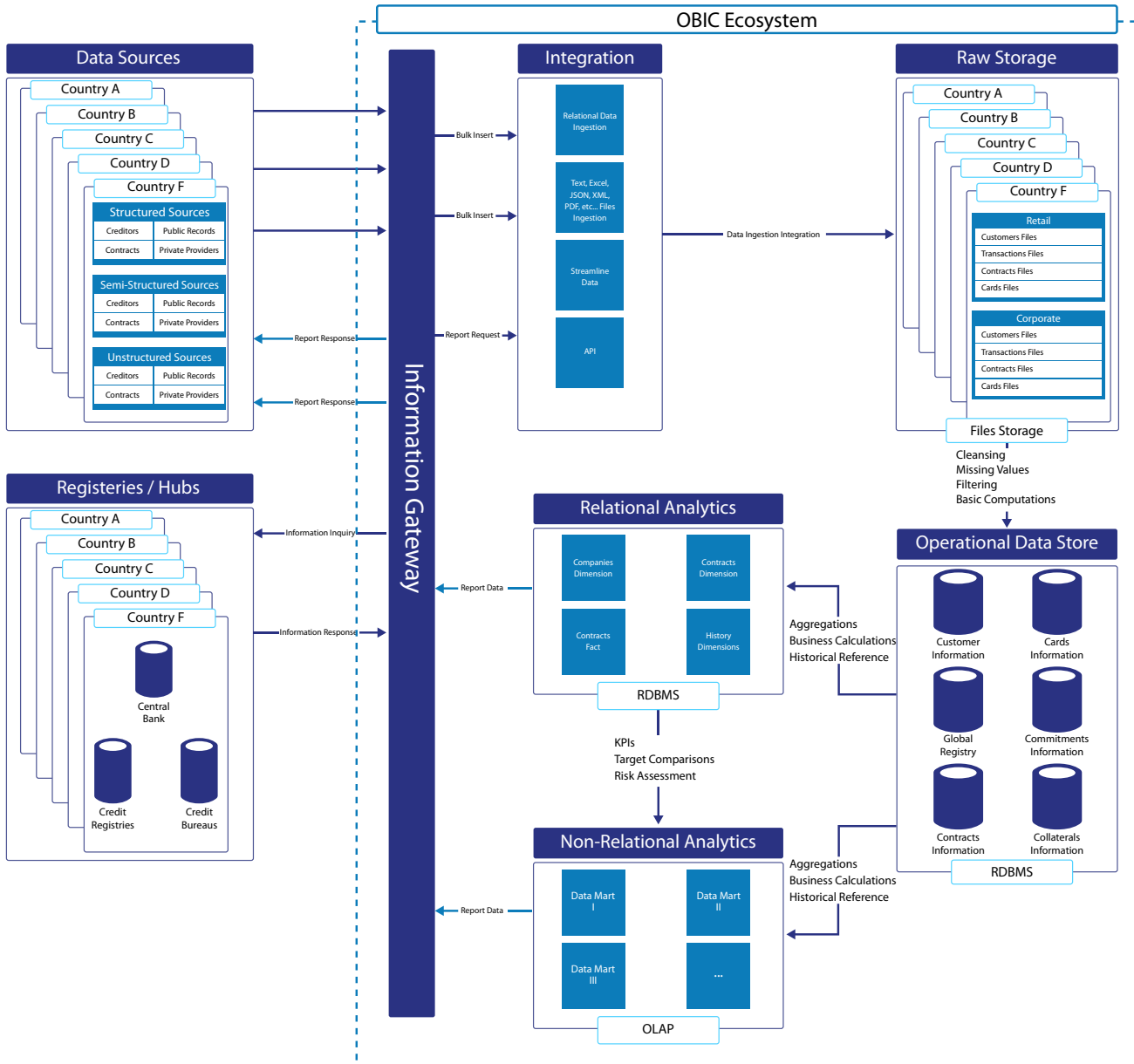
44. OBIC will introduce in future phases artificial intelligence and machine learning techniques to handle specific use cases. Accordingly, OBIC will cater for this capacity by having a module capable of holding machine learning models and using them on the data where it resides to identify patterns and predict future values.

Open API

45. OBIC will need to extract information on a subscription based. Such subscriptions may include sharing industry level, country level, or company level analytical information. Consumers who are subscribed will be utilizing an API-based system which will send them the related report on-demand.

V. TECHNICAL ARCHITECTURE

- 46. This section will shed light on the needed technical design and architecture of the OBIC data warehouse.
- 47. The different layers are established in the following diagram:



Global Registry

Summary

48. The Global Registry will include a single relational database in SQL Server with concurrent connectivity.

Access

49. Access to this database will be granted to the Master Hub, and its data will only be exposed by company, whereby for each company being queried, the system will log in to the Global Registry and return the associated companies that have credit information in other countries.

Sample Schema

- Countries
- Companies
- Shareholders
- Subsidiaries
- Company Details (e.g. date of establishment, number of subsidiaries, etc...)
- Etc...

Master / Local Hub

Summary

50. The data extracted from the API requests from the various service consumers is needed for multiple purposes, making the segregation of data essential to properly serve those requests. The key service areas of OBIC require the ability to tap into the system from different perspectives to get the needed results. Operational data and analytical / aggregated output is needed.
51. The local hubs requested to be installed in Tier C and D countries will be a replica of this architecture.

Integration

52. This layer will be a software layer, responsible for gathering and ingesting the different data structures from all the different sources, and it can be of 2 modes:
- Single record set mode: whereby the system receives a single inquiry in an API request, which it forwards to external credit registries to get the needed information through the information gateway. If the agreement with the creditor (requester of the report) is to save the request's data in the master hub, then the incoming request and its resulting response will be stored.
 - Bulk mode: If there's an agreement to import the bulk data of some credit registry, then bulk mode will be used to store the entire dataset in the master hub.

Diversity of Sources

53. Sources of information are rarely in the format the end-users desire. Some sources of data may be stored in relational systems, others in semi-structured formats like XML and JSON. However, knowing that 80% of data worldwide is unstructured in nature, a modern EDW must cater for the storage and processing capabilities of such data. Accordingly, the approach that will be adopted in OBIC is to hold a storage system that is capable of ingesting data of any structure.

Raw Data

54. This layer holds all the data in its raw form, regardless of its periodicity, structure, and origin.
55. Ingested data from the integration layer will be loaded into the first storage layer, whereby data is stored in its original form. This layer is essential for the centralization of data as a first step, in addition to accommodating for any structures coming from the data sources.
56. The following characterizes this layer:
- Data in this layer is stored as files

- Storage is done in any format
- Storage is replicated and supports failover
- Storage supports unstructured data
- Storage is schema-less
- Storage is distributed and scalable
- Storage is segregated by country to better manage security, accessibility, and later business rules
- Storage will be segregated by key business areas (e.g. Retail Vs. Corporate)
- Purpose:
 - o Centralization of data into a data lake
 - o Hosting multiple data formats
- Audience of this layer:
 - o IT administrators

Operational Information

57. Data in its raw form serves none of the services needed by OBIC, but is needed. The operational data store represents the granular curated data that can be consumed by external systems / APIs.
58. This storage layer will contain:
- Cleansed data: Raw data coming from the previous layer will contain random data without pre-assumption on its integrity. In this layer, basic data type conversions, basic integrity constraints have been made and imposed
 - Missing Values: Being of various formats and structures, the data in the previous layer will have a considerable amount of missing values of many fields. Those fields are checked for missing values and stored in this layer after being handled.
 - Filtering: Data coming from the source systems may contain data that's not needed for analysis / reporting purposes. Accordingly, the data in this layer will contain only the filtered-out data needed
 - Basic Computations: Basic and minimal aggregations are stored in this layer without having complicated business transformations done.
 - Purpose:
 - o Support operational reports for technical and operational advisory
 - o Single point of truth for direct inquiries or listing reports
 - End users of this layer:
 - o Creditors
 - o Data subjects
 - This layer will model data into relational form as a Staging database, whereby the normalized data modeling principles will be adopted.

Analytics and Intelligence

59. This layer holds the business effective data, with all the needed computations, archiving, and aggregations performed. The following problems are addressed and dealt with:
- Complex Business Calculations
 - Historical Reference

- Credit Scoring
- Pattern Recognition
- Archival of Historical Data

Relational Data Warehouse

60. The staging data store enables listing reporting capabilities and some inquiries, without the capacity to host the business calculations and aggregations needed for the strategic advisory purposes.
61. This layer is characterized as:
 - Star Schema: The relational data warehouse will consist of a star-schema modeled data warehouse composed of dimensions and facts. Each dimension will represent a certain business area, whereby facts will contain the measurable values of those business areas.
 - Denormalized modeling
 - Business Calculations: all the related computations for each business use case / requirement is done in this layer.
 - Aggregations: information is aggregated by all its respective business entities so that the analysis is made easier with better performance.
 - Purpose:
 - o Support reports for strategic advisory
 - o Single point of truth for cross-border checks, country, industry, or company level analysis
 - End users of this layer:
 - o Governments
 - o Investors
 - o Creditors

Information Gateway

62. This layer will be a software layer which is responsible of:
 - It will be the single touch point of the master hub with external systems.
 - Managing the data movements in and out of the master hub
 - Routing requests coming from the requesters (e.g. creditors) to the external credit registries residing in MCs, and then the response back to the requesters.
63. It will contain a portal, a service area, and a set of reports including:
 - Request for Information: the interface where the user will request data from the OBIC
 - Registration: management of the registered subscribers and their profiles
 - Profit Calculation: details on the profits generated by the subscribers
 - Communication Management: managing data communications between the different systems
 - Global Registry Management: managing /calibrating the rules upon which unique identification of corporates is done and amended.

I. HARDWARE & SOFTWARE SPECS ESTIMATE

64. The below table lists the required hardware and software licenses cost for each server:

Server Name	Number of Servers/Nodes
Hadoop	6
Processing Cluster	6
DWH Cluster	2
External Shared Storage	1
API Portal:	
Web Server	2
Application server (WebLogic)	2
UAT - ESX hosting Hadoop - Processing - DWH -Web Application servers)	2

II. BLOCKCHAIN FEASIBILITY STUDY

EXECUTIVE SUMMARY

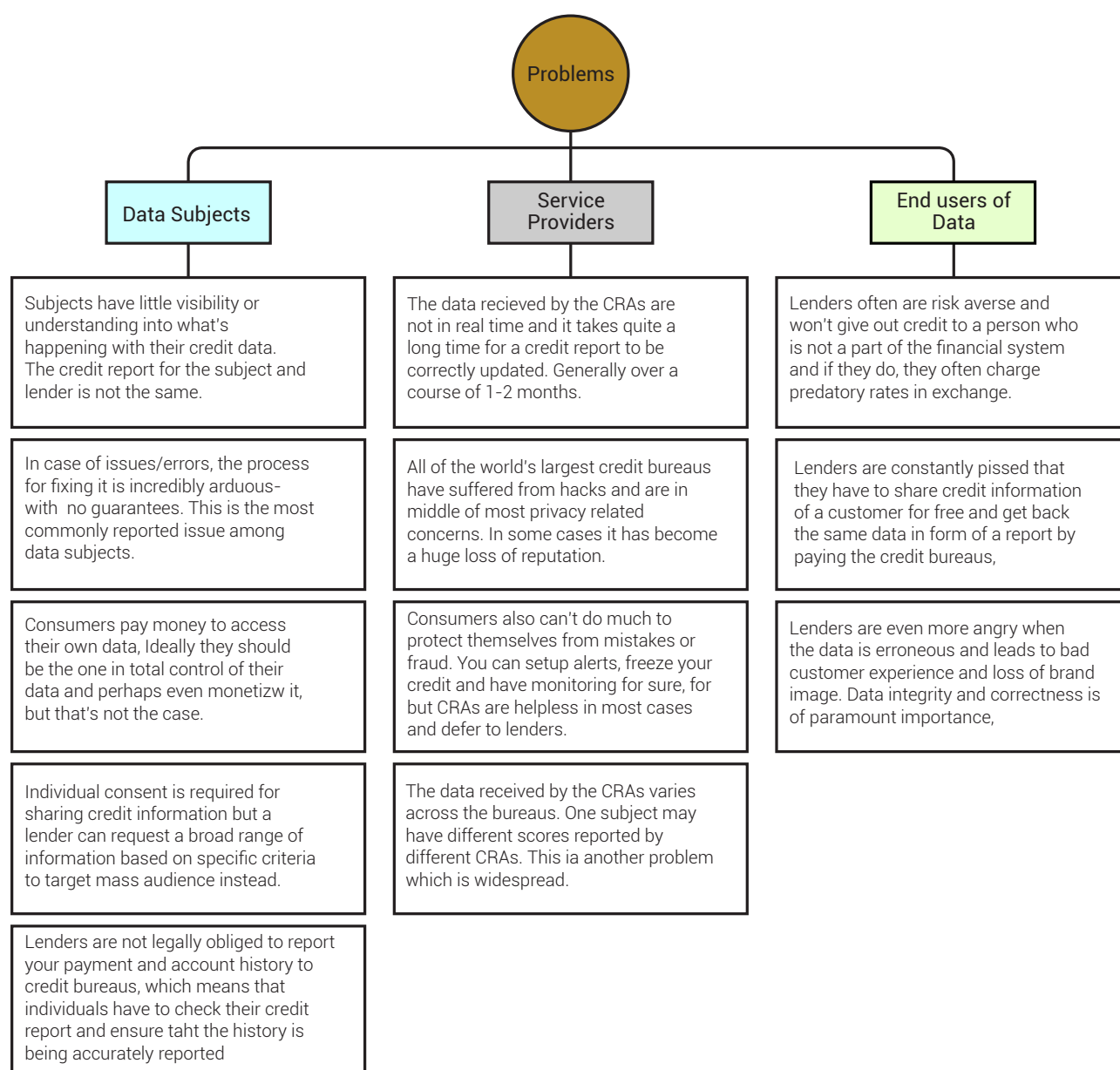
65. The OIC regions' overall credit information systems fall far below global benchmarks, with private registry coverage at only 11% of the adult population in 2016, based on World Bank data compared to 66% of coverage across the OECD. The vision of OBIC is to enable all OIC MCs to have the strongest investment, financing, and trade development in the world through a best-in-class business growth and risk management intelligence ecosystem. A cross-OIC credit registry and infrastructure will be a hallmark of the Centers offerings, providing both the technology platform as well as credit data infrastructure that can be leveraged at country level (for those with no or very little credit infrastructure) or those ready to share and leverage cross-border credit intelligence. Blockchain poses a solution for disaggregating private data and make it available to all parties. Additionally it will be an important component in the overall system that can be used to augment the integrity of the data, ensuring that the storage of any collected data is decentralized and cannot be altered or modified.

DESCRIPTION OF PRODUCTS AND SERVICES

66. ICIEC is considering a move to create a platform for providing Credit Information to OIC Member States along with a Business Intelligence center to bring data driven decision making in lending. By doing so they hope to bridge the gap between global credit reporting and OIC Member Countries. They aim to leverage new technological capabilities such as Blockchain, Machine Learning and Artificial Intelligence in their solutions to augment its capabilities to deliver an all-round holistic solution.
67. This feasibility study is aimed at deciphering the role of Blockchain in augmenting the solution so as to deliver on its proven capabilities of immutability, provenance, data integrity and decentralization of information.

ISSUES PLAGUING CONSUMER CREDIT BUREAUS

68. It's no surprise that Consumer Credit reporting agencies are one of the most hated entities by people globally. For example, Equifax Inc., one of the three main credit bureaus in the U.S., was the most complained about financial institution in 2017 in 49 states and Washington D.C. according to the CFPB's complaint database. And this is the developed world we are talking about. Developing nations present a host of other challenges to deal with. However, CRAs do play a vital role in an economy and their importance cannot be slighted. But, if it were possible to improve upon their shortcomings to build a better system, it would be a boon for the common people and the country in every respect.



69. The ultimate aim of the OBIC is to transit to implement a full blown CRA for the OIC MCs. However since this is a big target to achieve it has to be broken up into modules which when completed in phase will contribute to building a robust system which can be in future combined together to have a full-fledged system that has the benefits of traditional CRAs and the Business Intelligence network to support a multi-party system spanning over 50+ member countries.0

PRODUCT

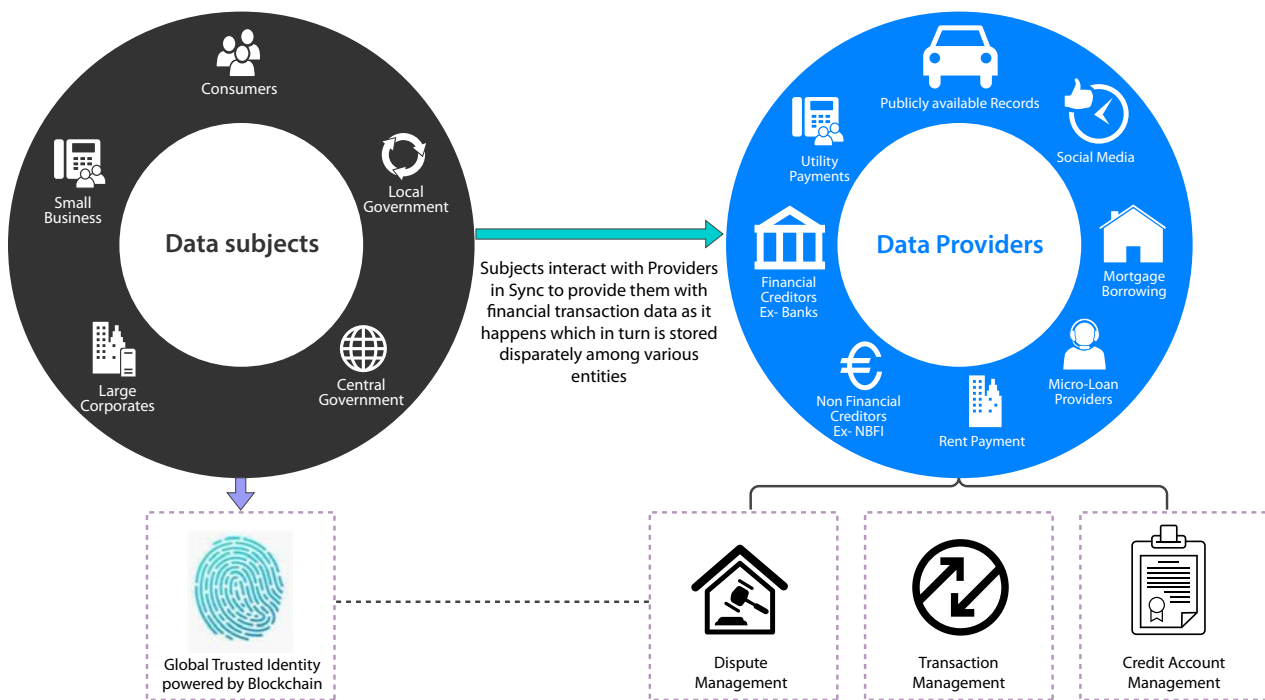
70. Islamic Banking & Financing along its products have always strived towards achieving social benefit for the greater good and aimed towards improving the lives of the common people. It would therefore make sense that a new product is designed on the same values. However since a blockchain based distributed system is currently at the edge of the technology, it has to be implemented in phases to reap the maximum benefits. Based on this we have divided our solution to be delivered in 4 phases and 3 modules keeping the near future in mind.
71. A blockchain based solution will augment the main solution to provide it with better data integrity rules, ensure that users are the owners of their personal data and above all decentralize the data in a way that makes it extremely

difficult to tamper with. In the near future the scope of the solution can be expanded to automatic settlement and reconciliation of transactions without 3rd party intervention.

- 72. Since a lot of new innovations are happening in the space and we will only see the technology grow by leaps and bounds in the coming years. Take for example Micro lending. A new system where users are using blockchain based micro lending platforms and exchanging value in form of cryptocurrency. This is just one example of multiple ones where new avenues of business are opening up and ensuring we have a blockchain solution to handle them will keep the designed system at the forefront of technology.

Product Modules and Stakeholders:

- 73. The blockchain product will be divided into 4 modules and each modules will follow the next in a phased manner of implementation. The 4 modules are Identity, Dispute, Transaction and Credit accounts. Transaction Management and Credit Account management are part of Phase-3 and Phase-4 and as such do not warrant a discussion as of now, because we anticipate a lot of changes to come with the first 2 phases.



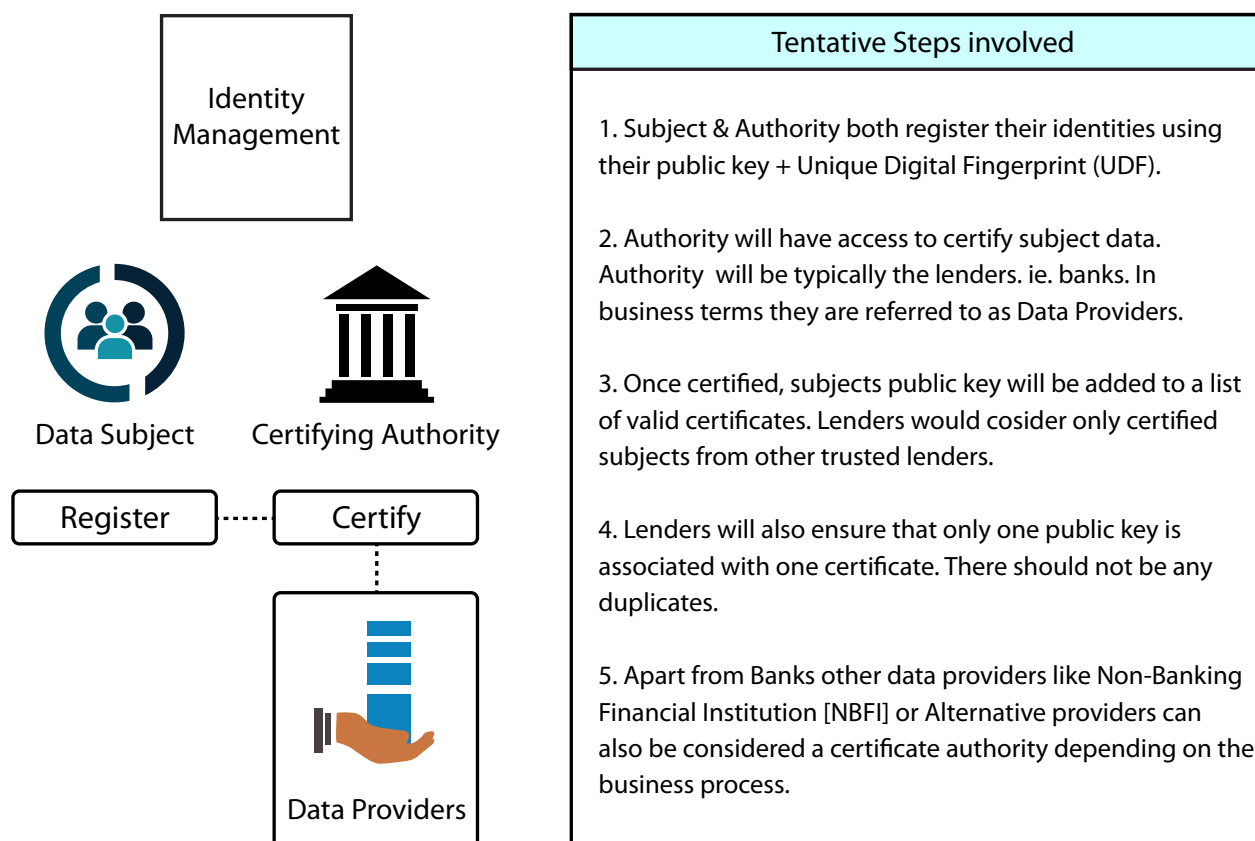
- 74. Let's get into the details for the first 2 modules that are of particular importance. However we will have a partial implementation of the Transaction management system active in Phase-2 to work alongside the dispute management system since we would need to track the details of transaction for which dispute is raised.

Source:

1. Consumer Complaint Database data for 2017: <https://lendedu.com/blog/us-heatmap-cfpb-complaints>
2. Data breaches before Equifax: <https://www.tripwire.com/state-of-security/security-data-protection/4-credit-bureau-data-breaches-predate-2017-equifax-hack/>
3. Capital one breach: <https://www.consumer.ftc.gov/blog/2019/07/capital-one-data-breach-time-check-your-credit-report>
4. Equifax breach: <https://epic.org/privacy/data-breach/equifax/>

Module - 1: Identity Management Module

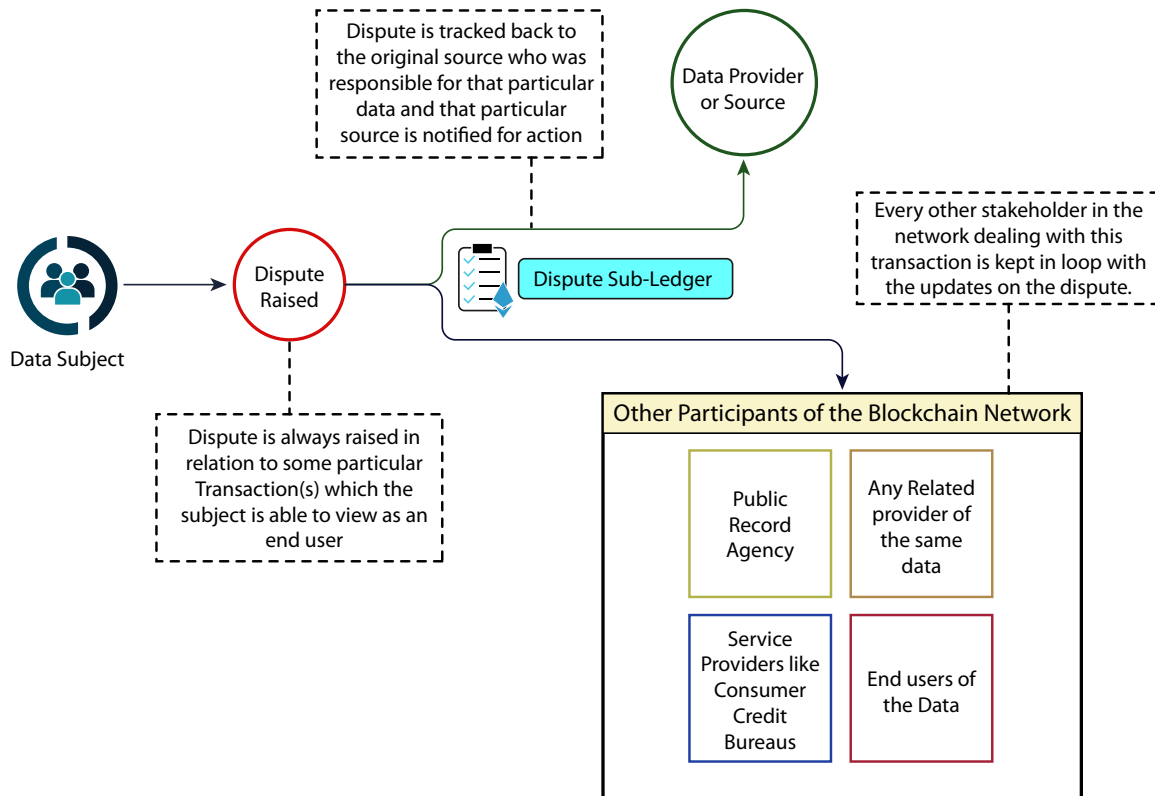
75. One of the main issues in credit reporting and especially in distributed systems is Identity Management. There are 3 main points when designing an identity management system.
76. First, it should be unique; No 2 sources can have the same one. Secondly the identity should be non- masqueradable; one cannot use or copy another's identity. Third and final is that, we should have a system for grouping of Identities; For example a company registered in multiple countries having a single identity to track back all its subsidiaries.



77. The Identity Management module will assign unique accounts for all the parties in the transaction with a public-private key combination. That makes it a one of a kind identifier which will be very useful when we add more modules to the system. Without this, we won't have any other blockchain module in place.

Module - 2: Dispute Management Module

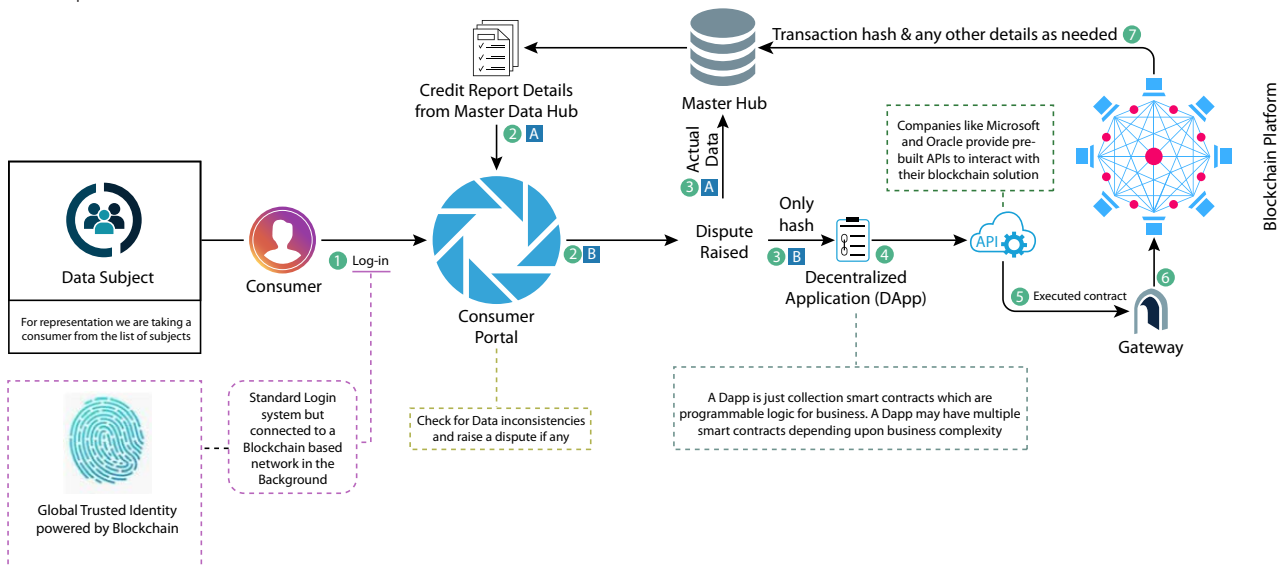
78. With a dispute management system in place we will address one of the core problems that current generation consumer credit agencies (CRAs) have failed to address. Erroneous reporting, long reporting & resolution process sometimes ranging in months, incorrect credit details leading to damaged credit scores are just a few to name when dealing with this situation in real-world cases.



79. The Blockchain aspect triggers in the background when a dispute is raised by a data subject. There is a sub-ledger which would record the “disputed data” provided by the subject and and share it across the network participants. Validity of the dispute will be checked by the particular provider who was responsible for the transaction. Once a consensus is reached, the details in turn gets updated for all stakeholders. None of the participants control the dispute ledger in whole, they all get updated asynchronously so that it doesn't matter if they were online at that moment or not, the ledger metadata is immutable and auditing it is extremely easy for regulators in case of any issues.

Overview of the Business Architecture combined for both Modules:

80. **Objective:** Show a complete transactional lifecycle as it moves through the system in case of Dispute Management from the perspective of Blockchain taking a single data subject (in this case a general consumer) for easier representation.



Value Proposition:

- Have strong data integrity rules that works throughout the information cycle until it reaches the master data hub.
- Traceability and accountability of transactions. For the initial phase we will be concentrating on dispute management.
- Establish the ground work for future integrations of ad-hoc blockchain modules to the solution that can augment the core offering.

Blockchain Platform	Network Type	Industry Focus	Network Launch*	Popularity*	Activity*	Support Type	Crypto Facility	Supported Languages	Have we explored
Ethereum	Public	Cross-Industry	2015	Very High	Very High	Community & EEA	Yes	Solidity, Python, Go	Yes
Hyperledger - Fabric *	Private	Cross-Industry - Primary Finance & SupplyChain	2017	High	Very High	Community & Project members	No	Go (Stable), Java (Future)	Partially
R3 - Corda *	Federated	Finance	2017	High	High	Corda Enterprise	No	Kotlin, Java	Yes
Ripple *		Settlement. Payment process & Cross Border Payments	2016	Medium	High	Ripple Enterprise	Yes	JS (Beta), Future all lang support	No
Quorum *	Federated	Finance	2016	Medium	High	J.P Morgan	No	Solidity	No
Monax	Private	Cross-Industry	2014	Medium	Moderate	Platform Partners	No	Solidity	No
Multichain	Private	Cross-Industry	2014	Medium	Moderate	Platform Partners	No	Go, Python, Java, Ruby	No
BigChain DB **	Private	Cross-Industry	2016	Medium	Low	BigChain Corp	No	Python	No
Interstellar (Stellar+Chain)*	Private	Finance & Asset Management	2018	Medium	Moderate	Interstellar	Yes	Ruby, Java	No
Parity - Substrate*	Private	Cross-Industry	2018	Low	Low	Parity	Yes	Rust	No
Hedera - Hashgraph **	Private	Cross-Industry	2018	Low	Low	Swirls	Yes	Solidity	No

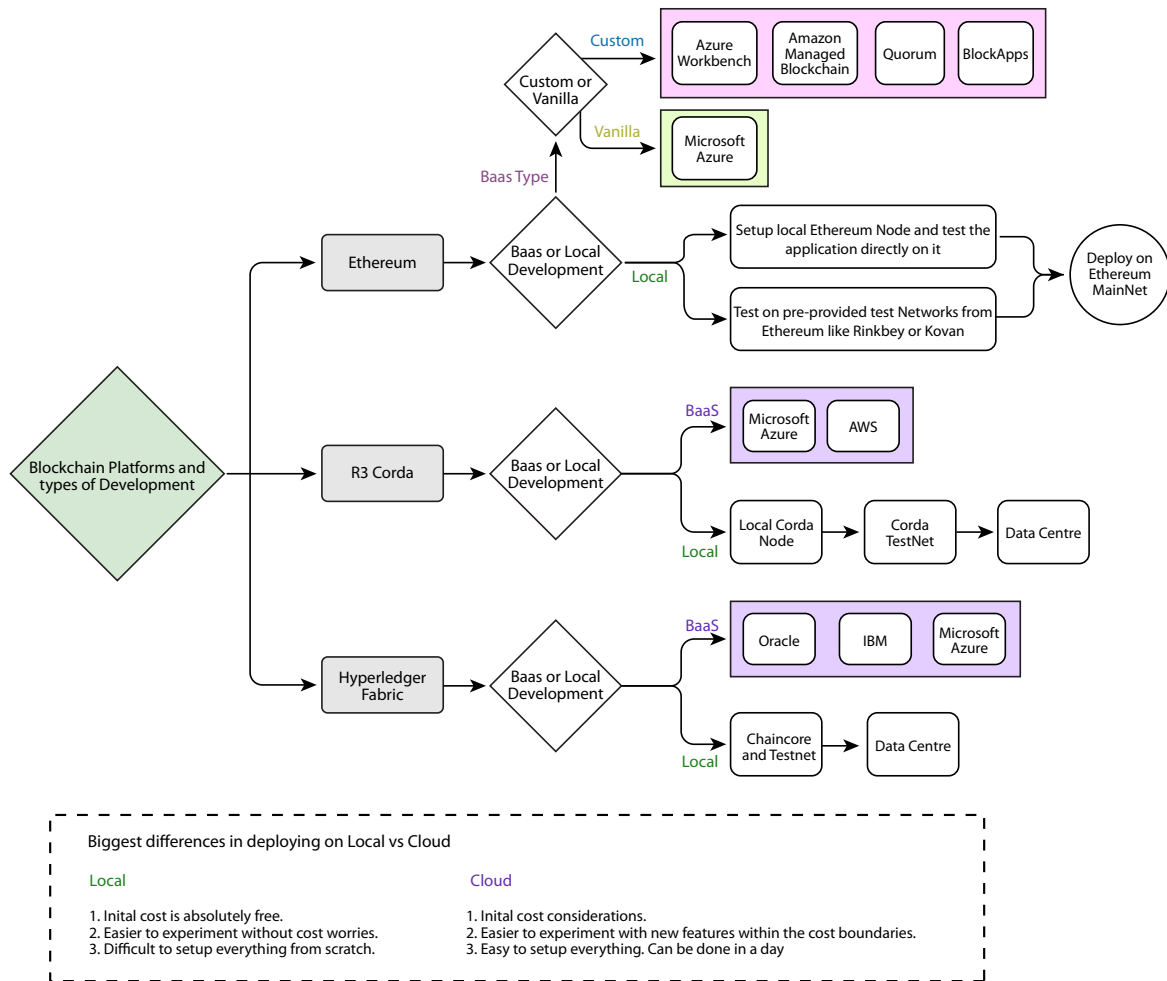
* = Completely Centralized
 * = Database Solution
 * = New Solution

BLOCKCHAIN PLATFORM AND SOFTWARE CONSIDERATIONS

81. We have multiple platforms to choose from as of present; each with its unique USP. These platforms are broadly grouped into 2 categories: Permissioned & Permissionless. Based on the platform the type of software changes. As a general policy for most of the platforms which are permissioned there is a developer community edition for trials and an enterprise edition that would cost licensing fees. For permissionless and completely public platforms like Ethereum however there is no cost on the software or licensing. The product being developed will be on one of the numerous ready to use Blockchain platforms which will serve as the base layer on top of which development occurs.
82. We have done a comprehensive analysis of the top platforms in use today for enterprises. Based on the requirements, we will be able to zero in on a base platform to develop on. Prices will vary based on the type of platform selected. In general permission-less platforms like are cheaper than their permissioned counterparts. However permissioned platforms have the advantage in speed and privacy for now.
83. For more information please have a look at the presented comparison matrix.

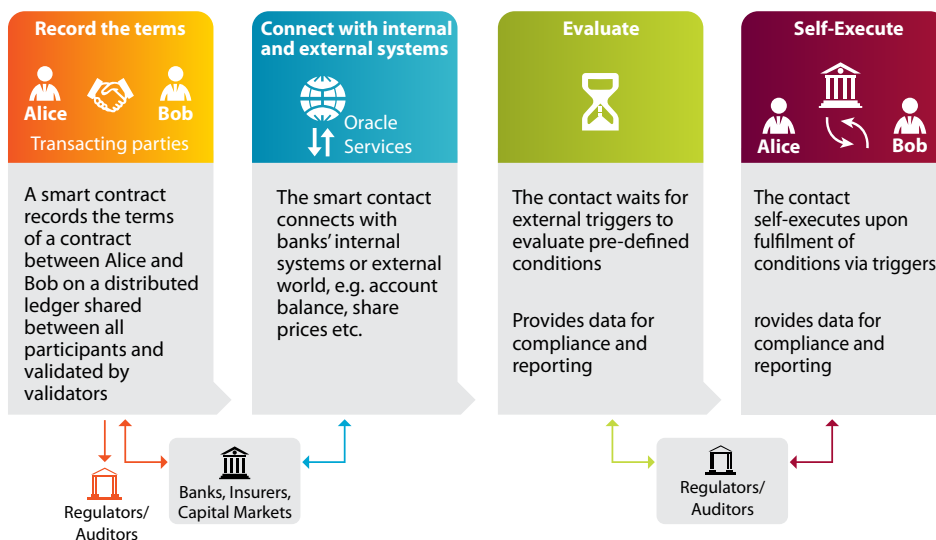
Deployment Strategies:

84. Just like for any technology right now, we have an option of on-center deployment or deployment on the cloud. Just like before depending on client requirements we can choose accordingly.
85. There are 2 ways to normally deploy a blockchain platform. The easy method is to use a provider like Microsoft, Amazon or Oracle to host the nodes and do the administration stuff just like a cloud deployment as of now. This offloads the balance to the providers while you focus on improving your product. These solutions are commonly referred to as BaaS (Blockchain as a service). The Second method is to run your own nodes and host them on your own data center. We have highlighted the process for the top 3 blockchain platforms in use by most enterprises as of now. Ethereum is a public and permissionless blockchain while Corda and Hyperledger Fabric are private implementations and permissioned in nature.



Smart Contract Lifecycle:

86. Smart contracts are a big part of the system irrespective of the blockchain platform you choose to go with. We believe that as of now a permissioned, distributed ledger smart contract system would make most sense for the industry in the majority of cases. It assures a secure, private, and scalable platform connecting all key stakeholders. However with public platforms developments occurring at a very fast pace, it will be just a matter of time before they remove their current inadequacies.



SETTING EXPECTATIONS AND REALITIES

87. While we proceed with this study it is important to set the expectations to the current realities in the Blockchain space. Currently Blockchain technology is at the cutting edge of innovation and as such it is in a constant state of flux with new developments happening at a very fast pace. New features are being added by various firms and independent contributors on different platforms. Standardization of techniques and tools and working methods are also work in progress. As with any new technology, it will take time for the technology & industry to move ahead and have standardized features. If we move from technology and see the Industry as a whole, we currently have very limited players who are offering a pure blockchain based credit reporting service. Most of the startups in the space are looking at disrupting the market strongholds of the CRAs. Here are some of them who are working in this space: Bloom, Colendi, Kiva, Guppy, Spring Labs, Cerved & Enigma.

Brief of expectations as per OBIC Report:

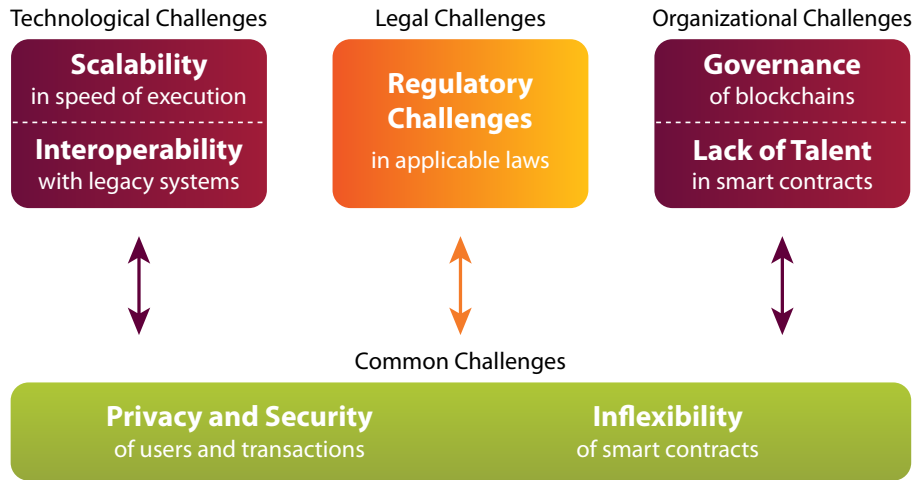
- Projections indicate around 50,000 daily users on the platform in next 5 years. –(P41)
- Separate databases for sharing data within countries and across OIC. –(P41)
- Scalable database with improvements made over time for usability. –(P41)
- DB should accommodate around 100,000 records at least. –(P41)
- Standard data security & access rules to be implemented. –(P41)
- Standard report from OBIC – Data: Name, existing financial commitments, loan, report from trade partners, revenue estimates along with alternative data sources. –(P39)
- Standard report from OBIC will be monetized according to meeting notes.
- Data sources can challenge incorrect data and raise disputes. –(P39)

Overview of the Business Architecture combined for both Modules:

- Blockchain solution works best with multi-party systems. We would need to onboard partners from all value segments; from data providers, to data subjects and service providers along with end users.
- Blockchain solution doesn't work in isolation. It needs an assortment of web technologies to work in conjunction. For example the UI will be built just like its being done today. It will be used to augment the system being developed.
- Irrespective of the blockchain solution, there will be large data storage considerations to take into account. Again, it's same as today; either dedicated datacenters or any cloud providers. Cloud option is much simpler from a deployment perspective.
- A blockchain solution architecture will differ based on the platform (Public vs Private vs Consortium). There will be changes on a core level based on what platform is used. Hence, selecting a proper platform & partner is very important.
- Please keep in mind that any "data" that is saved on the blockchain is permanent and cannot be deleted. Also the security of our approach is dependent on the security of the cryptographic primitives.
- It is advisable to refrain from saving the actual credit data in smart contracts Or IPFS, but instead rely on saving its hash.
- Blockchain solutions as of today are mostly in pilot or limited production releases. The reason is simple; they are untested technology.

Source:

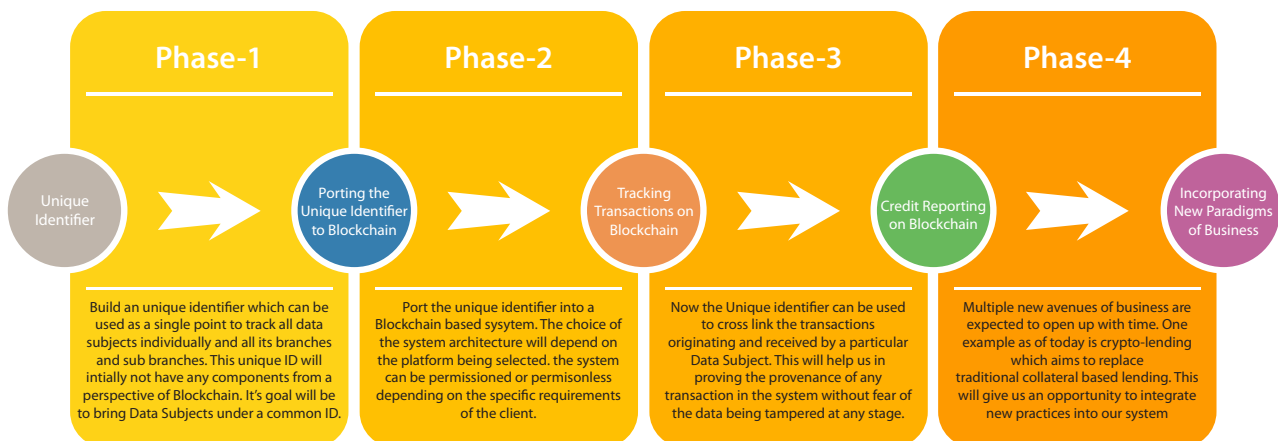
5. Kiva Protocol: <https://www.kiva.org/protocol>
6. Kiva Protocol in Sierra Leone: <https://cointelegraph-com.cdn.ampproject.org/c/s/cointelegraph.com/news/nonprofit-launches-blockchain-platform-for-credit-history-in-sierra-leone/amp>
7. Bloom Protocol: <https://bloom.co/identity>
8. Spring Labs: <https://www.springlabs.com/>
9. Colendi Protocol: <https://www.colendi.com/>
10. Challenges in Smart Contract: https://www.capgemini.com/consulting-de/wp-content/uploads/sites/32/2017/08/smart_contracts_paper_long_0.pdf



- Blockchain solutions are generally proposed by providers in 2 ways:-
 - Reimagine the entire problem statement and go against all conventions and get a new business process in place to accommodate with the technology. Sometimes minor tweaks is all it takes and other times it's a complete overhaul.
 - Build the solution step-by-step and progress with the technology as the industry moves forward. The best example is decentralized data. Right now solutions are forced to use centralized processing databases like SQL, but this is poised to change in near future with newer protocols like IPFS & Swarm gaining prominence and becoming increasingly easier to use.
- We are proposing the second method as we feel it's best to take advantage of current technological paradigms while being mindful of the near future.

SCHEDULE & PLANNED ROADMAP

- With this section we intended to provide a high level framework for implementation of the product or service being considered. Below we have targeted milestones and timeframes for completion as a guideline only. This section is not intended to include detailed schedule as this would be developed during project planning should this initiative be approved.
- As mentioned in the previous sections we are dividing this initiative broadly into 4 Phases for implementation. Each phase will have its own cost considerations based on the particular requirements. The phases are merely framed guidelines and are flexible in nature; it can be changed based on specific inputs and future consultations with partners.



Phase-1:

90. The first phase will not involve a blockchain based approach but rather work on creating a base layer system compatible with current standards while having the ability to plug into a blockchain system (being developed in Phase-2). The actual solutioning to this with detailed technical architecture will be done pertaining to more details as they emerge based on requirements.

Phase-2:

91. In this phase we will proceed with integration of the Unique Digital Fingerprint (UDF) with our new Blockchain based system along with a partial run of some other components. Based on preliminary research we have divided the proposed system into 3 components. However based on the current assumptions we will go into the overview of only one component; identity management since it would be relatively easier to modify according to the specific needs unlike other components.
92. Here are some of the goals we will be focusing on this phase.
- User friendly interface to abstract underlying cryptography. People who are going to use and existing users should not face additional complicity in using the system. The effort will be to keep it simple and seamless.
 - Total integration of the Unique Digital Fingerprint of the Data source with the Blockchain based system for a Global Trusted Identity (GTI). The Identity management contract will handle this part of the system.
 - We will take a subset of transactions from selected parties and do an integration with the Transaction Management of the Blockchain system. This will be our pilot program and depending on the results we achieve we take decisions on how many parts we want in Phase-2 and how much to push to Phase-3.
 - Smart contracts which will be responsible for Identity Management, Credit Account Management and Transaction Management. Credit Account Management will help streamline and automate some of the activities which are fairly regular between Financial Institutions and Borrowers while Transaction Management will keep a tab on all transactions occurring the system and help track the data like an asset throughout.

FINANCIAL DETAILS BLOCKCHAIN HOSTING AND SETUP

93. Below table shows the cost of hosting the Blockchain solution which is added here as an optional in case it is decided to proceed with implementing the solution on Blockchain based on the feasibility study above.

Cost description	Total
Blockchain Cloud Service (BaaS) Plus Ongoing ICT Support	\$60,000 Yearly
Initial setup/configuration One-Time cost	\$10,000

III. ASSUMPTIONS

- This report assumes that sharing data outside the countries' borders will be permitted by the respective MCs
- The centralized data warehouse will include credit information for companies / corporate only, and not consumers
- Integration: Assuming 10 sources of data for integration purposes at the beginning of the project
- Hardware sizing is assuming 3 countries' information
- Network and other infrastructure are not considered in the recommended HW and SW.
- Already established country credit registries / local geography data hubs for credit registries will have an API that OBIC can call to retrieve information about the company applying for a contract.
- Assuming 5 data marts to be developed in Analytics and Intelligence section
- Subscribers' payment method is assumed to be managed between OBIC staff and the registered members privately (i.e. not through the system)
- For Disaster Recovery we assume other countries will mirror the same platform, hence did not add disaster recovery specs and cost.
- Block chain:
 - o Two members on the chain
 - o 500 transactions per hour

Appendix

Appendix I – OIC Member Countries Credit Intelligence Maturity

Country	Region	% of Ppn in Public Registry	% of Ppn in Private Bureaus
Turkey	MENA-Other	77%	0%
Malaysia	East Asia	62%	76%
Brunei Darussalam	East Asia	72%	0%
United Arab Emirates	MENA-GCC	9%	54%
Kazakhstan	Central Asia	0%	52%
Indonesia	East Asia	52%	0%
Iran	MENA-Other	51%	51%
Gabon	Sub-Saharan Africa	51%	0%
Saudi Arabia	MENA-GCC	0%	48%
Albania	E. Europe	39%	0%
Azerbaijan	Central Asia	36%	1%+
Tajikistan	Central Asia	0%	36%
Kuwait	MENA-GCC	15%	31%
Kyrgyzstan	Central Asia	0%	31%
Qatar	MENA-GCC	31%	0%
Uzbekistan	Central Asia	0%	28%
Tunisia	MENA-Other	28%	0%
Bahrain	MENA-GCC	0%	26%
Morocco	MENA-Other	0%	25%
Oman	MENA-GCC	23%	0%
Maldives	South Asia	23%	0%
Lebanon	MENA-Other	22%	0%
Egypt	MENA-Other	7%	22%
Guyana	Americas South	0%	16%
Pakistan	South Asia	9%	6%
Cameroon	Sub-Saharan Africa	8%	0%
Comoros	Sub-Saharan Africa	8%	0%
Nigeria	Sub-Saharan Africa	0%	8%
Syria	MENA-Other	7%	0%
Mauritania	Sub-Saharan Africa	7%	0%

Uganda	Sub-Saharan Africa	0%	7%
Mozambique	Sub-Saharan Africa	5%	0%
Algeria	MENA-Other	3%	0%
Jordan	MENA-Other	3%	0%
Chad	Sub-Saharan Africa	2%	0%
Cote d'Ivoire	Sub-Saharan Africa	0%	2%
Sudan	Sub-Saharan Africa	0%	2%
Sierra Leone	Sub-Saharan Africa	2%	0%
Yemen	MENA-Other	1%	0%
Bangladesh	South Asia	1%	0%
Afghanistan	South Asia	1%	0%
Benin	Sub-Saharan Africa	1%	0%
Senegal	Sub-Saharan Africa	1%	1%
Togo	Sub-Saharan Africa	1%	0%
Libya	MENA-Other	1%	0%
Djibouti	Sub-Saharan Africa	0%	0%
Burkina Faso	Sub-Saharan Africa	0%	0%
Niger	Sub-Saharan Africa	0%	0%
Guinea-Bissau	Sub-Saharan Africa	0%	0%
Turkmenistan	Central Asia	0%	0%
Iraq	MENA-Other	0%	0%
Gambia	Sub-Saharan Africa	0%	0%
Guinea	Sub-Saharan Africa	0%	0%
Somalia	Sub-Saharan Africa	0%	0%
Suriname	Sub-Saharan Africa	0%	0%
Palestine	MENA-Other	19%	0%

Source: DinarStandard analysis based on World Development Indicators 2017 data on Public credit registry coverage (% of adults) &

Private credit bureau coverage (% of adults).

Appendix II - Literature Review

1. McKinsey & Company. The national credit bureau: A key enabler of financial infrastructure and lending in developing economies. 2009.
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