

Analyse bibliométrique de la publication : "How to use Big Data technologies to optimize operations in Upstream Petroleum Industry"

Abdelkader Baaziz

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Submitted on 12 Feb 2020

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Analyse bibliométrique de la publication

How to use Big Data technologies to optimize operations in Upstream Petroleum Industry

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Comment utiliser les technologies des Big Data pour optimiser les opérations dans l'activité Amont de l'industrie pétrolière

Abdelkader Baaziz
Janvier 2020

Analyse bibliométrique de la publication :

How to use Big Data technologies to optimize operations in Upstream Petroleum Industry

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Comment utiliser les technologies des Big Data pour optimiser les opérations dans l'activité Amont de l'industrie pétrolière

1. Présentation générale de la publication

Cette publication est parue dans la revue « International Journal of innovation » [(1)] dédiée au management de l'innovation, une discipline **pluridisciplinaire** revendiquée par différents domaines des sciences humaines (aussi bien en sciences de gestion qu'en sciences de l'information) mais aussi des sciences du vivant et des sciences de l'ingénieur.

International Journal of innovation (IJI Journal) est un journal Open Access, sans frais de publication, à comité de lecture de type « peer review » et qui respecte les bonnes pratiques et normes éditoriales d'une revue de recherche. Malgré le jeune âge de ce journal, né en 2013, il est déjà, répertorié dans les diverses bases scientifiques :

- **Web of Science Core Collection (Emerging Sources Citation Index),**
- **Directory of Open Access Journals (DOAJ),**
- **ERIH Plus,**
- **EBSCO Host,**
- **PROQUEST,**
- **Red de Revistas Científicas de América Latina y el Caribe, España y Portugal (REDALYC);**
- **Portal de Portales LATINDEX,**
- **OpenAire,**
- **Gale Cengale Learning,**
- **DIALNET,**
- **Red Iberoamericana de Innovación y Conocimiento Científico,**
- **Système de classement brésilien QUALIS – B2 (Business Management)**

Ce papier a également été présenté (avec l'accord préalable de IJI Journal), au 21ème Congrès Mondial du Pétrole (21st World Petroleum Congress) qui s'est déroulé à Moscou (Russie) en Juin 2014.

World Petroleum Congress (WPC) est depuis **1933**, l'événement majeur et d'envergure mondiale réunissant les grands acteurs du secteur de l'énergie, notamment du pétrole et du gaz [(2)]. Il regroupe les compagnies et agences pétrolières et gazières nationales et internationales, les plus prestigieuses du monde. Il est organisé par le World Petroleum

[1] Publication consultable en Open Access au lien @ http://www.journaliji.org/index.php/iji/article/view/4 [Consulté le 20/01/2020]
[2] Site Web de Total @ https://www.total.com/fr/dossiers/futur-de-lenergie-total-au-world-petroleum-congress [Consulté le 20/01/2020]

Council (WPC) [3], une organisation internationale représentant le secteur pétrolier dans le monde entier.

Cette publication a fait l'objet (jusqu'en date du 19/01/2020) de :

- 25 citations dans des publications indexées dans Web of Science,
- Au moins 18 citations recensées dans des publications indexées dans Scopus,
- 67 citations dans des publications référencées sur Google Scholar,
- 44 citations dans des publications référencées sur ResearchGate,
- 02 citations dans des études prospectives publiées par le cabinet conseil « Deloitte »,
- Plusieurs citations dans des revues spécialisées dédiées aux professionnels du Pétrole,
- Plusieurs autres publications et communications (dont les citations sont mal-mentionnées ou non-conformes aux standards).
- Plusieurs études, thèses de doctorat et mémoires de master (dont les résultats n'apparaissent pas systématiquement sur Google Scholar et/ou sur les autres bases).

La publication a fait l'objet de trois (03) actes de plagiat, en Inde, en Chine et en Azerbaïdjan !

2. Citations de la publication dans Web of Science

La publication est citée par vingt-cinq (25) travaux référencés dans les bases de données du Web of Science (WoS), désormais « **Clarivate Analytics** ».

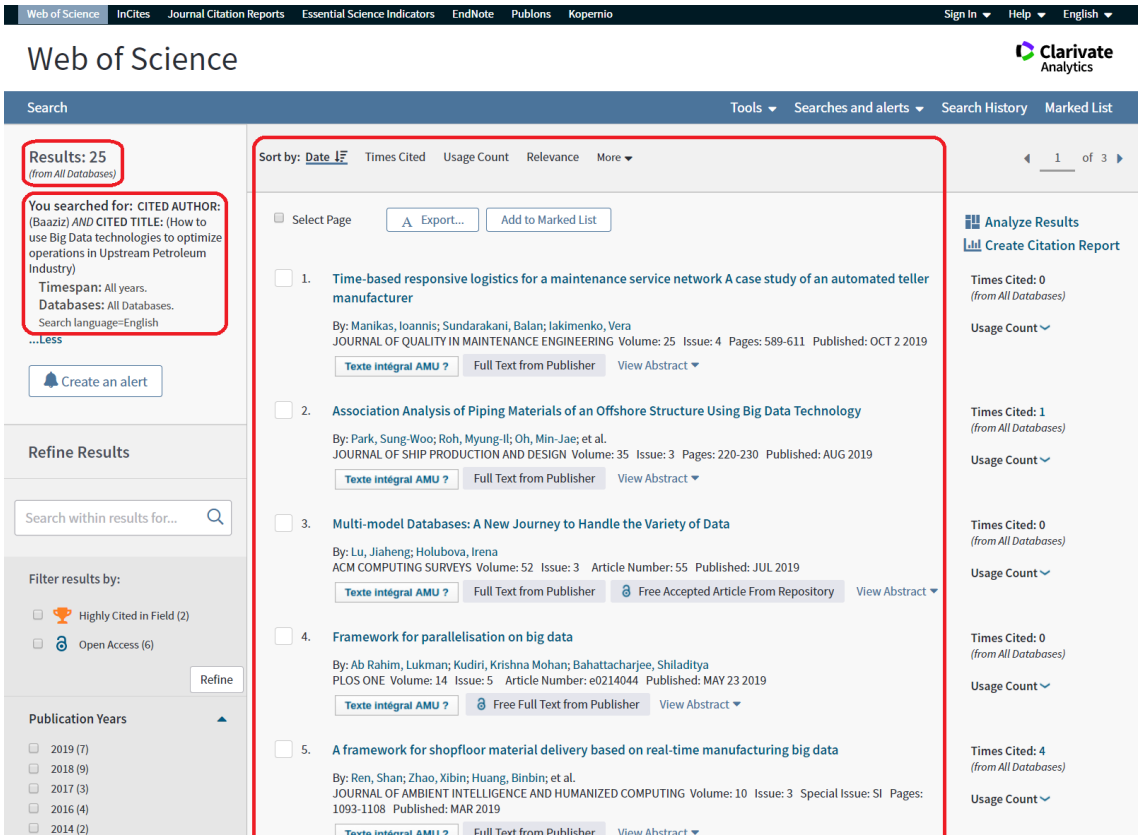


Figure 1. Les résultats de la requête effectuée lors de la recherche des citations

[3] WPC sur Wikipédia @ https://en.wikipedia.org/wiki/World_Petroleum_Council [Consulté le 20/01/2020]

Ce résultat est obtenu par l'intermédiaire de la requête lancée dans WoS :

"CITE AUTHOR" = (Baaziz) AND "CITE TITLE" = (How to use Big Data technologies to optimize operations in Upstream Petroleum Industry).

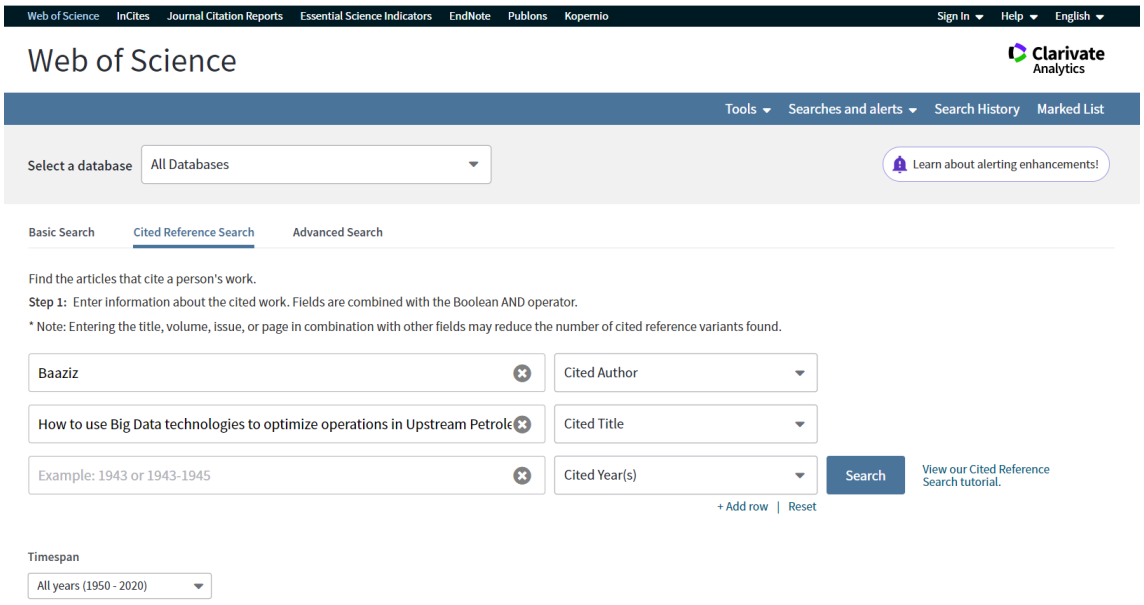


Figure 2. La requête effectuée lors de la recherche des citations

Les résultats ont été trouvés dans 04 bases différentes du WoS et se présentent comme suit :

La base consultée	Nombre de citations	Langues
Web of Science Core Collection	24	Anglais
Current Contents Connect	08	Anglais
MEDLINE®	01	Anglais
Russian Science Citation Index	01	Russe

Tableau 1. Le nombre de références qui citent notre publication par type de base consultée sur WoS.

La figure 3 montre que les citations trouvées dans WoS, sont réparties en vingt-cinq (25) disciplines différentes :



Figure 3. La répartition (en nombre) des références qui citent notre publication par disciplines.

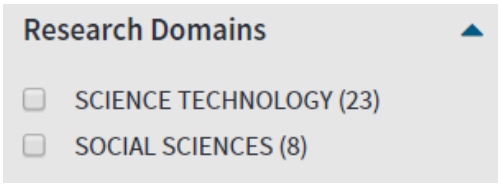
Cette répartition illustre parfaitement la pluridisciplinarité de notre publication. Elle montre aussi, que la publication joue son rôle clef de « médiation scientifique » auprès des chercheurs des différentes disciplines énumérées.

Répartition par domaines de la recherche :

Domaine de la recherche	Nombre de citations
Sciences et Technologies	23
Sciences Humaines et Sociales	08

Tableau 2. Le nombre de références qui citent notre publication par domaines de recherche.

Le nombre total de citations est supérieur au nombre de citations effectives du fait que certaines conférences ou journaux multidisciplinaires, sont classés dans plusieurs domaines de recherches.



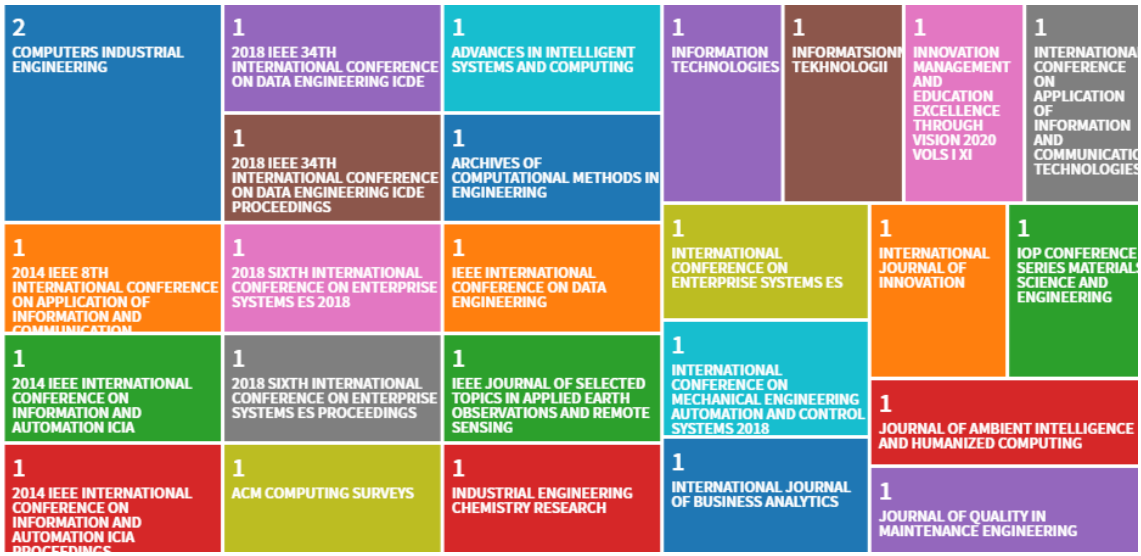


Figure 4. Liste des sources indexées dans WoS où les travaux citant notre publication, sont diffusés

Il faut noter que plusieurs auteurs qui ont cité notre publication, ont diffusé leurs travaux dans des revues à haut impact factor et classés selon « Journal Citation Reports » dans le Q1 ou Q2 de leurs disciplines respectives (figures 5.A – 5.F).

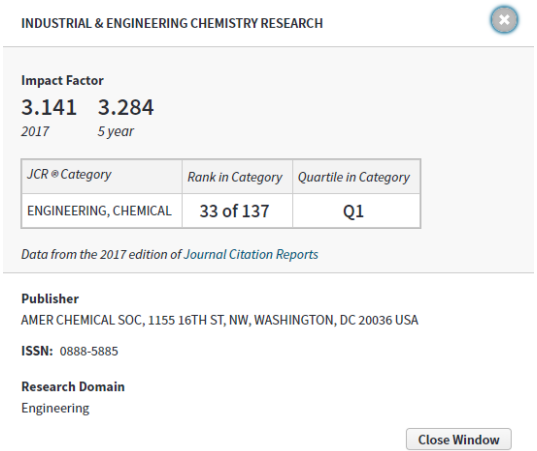


Figure 5.A

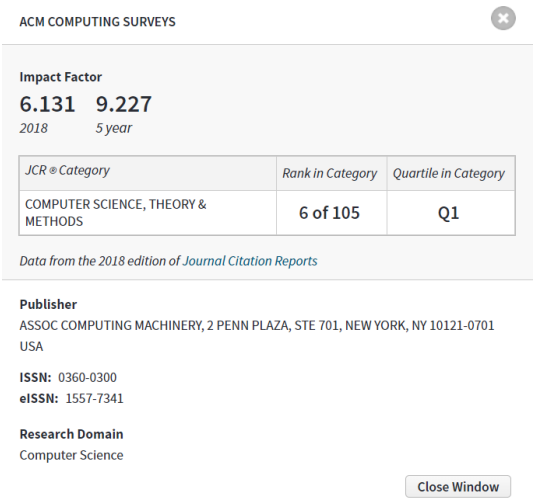
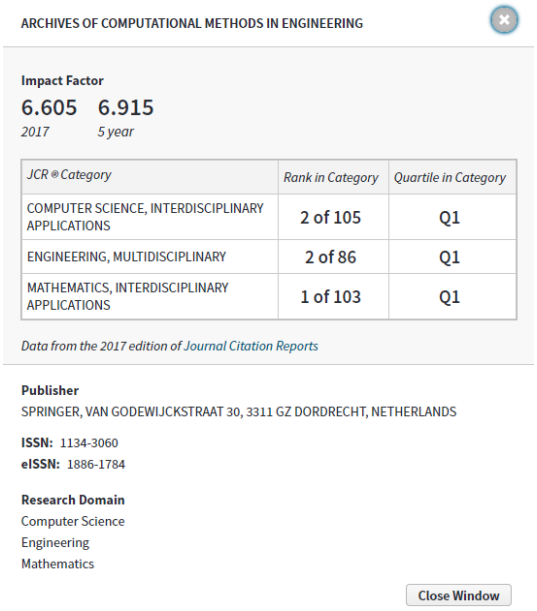


Figure 5.B



ARCHIVES OF COMPUTATIONAL METHODS IN ENGINEERING

Impact Factor
6.605 6.915
2017 5 year

JCR ® Category	Rank in Category	Quartile in Category
COMPUTER SCIENCE, INTERDISCIPLINARY APPLICATIONS	2 of 105	Q1
ENGINEERING, MULTIDISCIPLINARY	2 of 86	Q1
MATHEMATICS, INTERDISCIPLINARY APPLICATIONS	1 of 103	Q1

Data from the 2017 edition of Journal Citation Reports

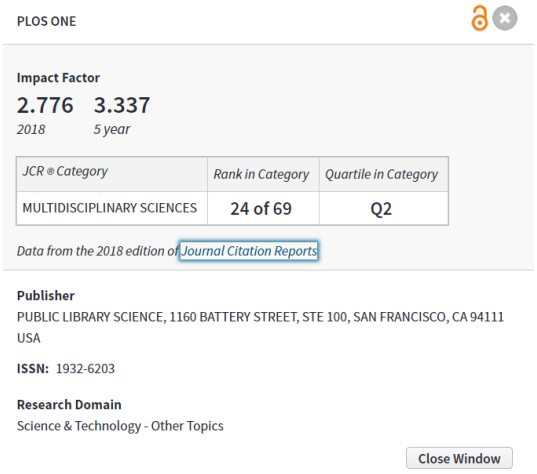
Publisher
SPRINGER, VAN GODEWIJCKSTRAAT 30, 3311 GZ DORDRECHT, NETHERLANDS

ISSN: 1134-3060
eISSN: 1886-1784

Research Domain
Computer Science
Engineering
Mathematics

Close Window

Figure 5.C



PLOS ONE

Impact Factor
2.776 3.337
2018 5 year

JCR ® Category	Rank in Category	Quartile in Category
MULTIDISCIPLINARY SCIENCES	24 of 69	Q2

Data from the 2018 edition of Journal Citation Reports

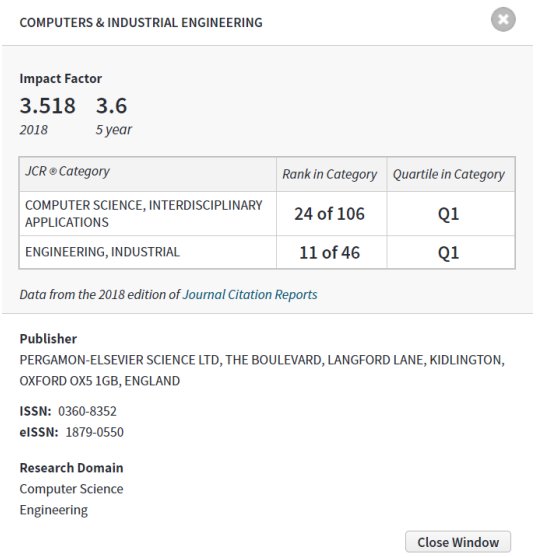
Publisher
PUBLIC LIBRARY SCIENCE, 1160 BATTERY STREET, STE 100, SAN FRANCISCO, CA 94111 USA

ISSN: 1932-6203

Research Domain
Science & Technology - Other Topics

Close Window

Figure 5.E



COMPUTERS & INDUSTRIAL ENGINEERING

Impact Factor
3.518 3.6
2018 5 year

JCR ® Category	Rank in Category	Quartile in Category
COMPUTER SCIENCE, INTERDISCIPLINARY APPLICATIONS	24 of 106	Q1
ENGINEERING, INDUSTRIAL	11 of 46	Q1

Data from the 2018 edition of Journal Citation Reports

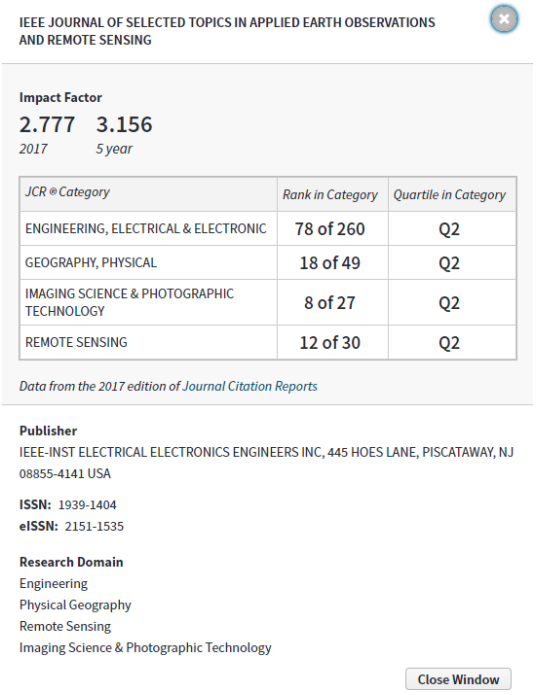
Publisher
PERGAMON-ELSEVIER SCIENCE LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND

ISSN: 0360-8352
eISSN: 1879-0550

Research Domain
Computer Science
Engineering

Close Window

Figure 5.D



IEEE JOURNAL OF SELECTED TOPICS IN APPLIED EARTH OBSERVATIONS AND REMOTE SENSING

Impact Factor
2.777 3.156
2017 5 year

JCR ® Category	Rank in Category	Quartile in Category
ENGINEERING, ELECTRICAL & ELECTRONIC	78 of 260	Q2
GEOGRAPHY, PHYSICAL	18 of 49	Q2
IMAGING SCIENCE & PHOTOGRAPHIC TECHNOLOGY	8 of 27	Q2
REMOTE SENSING	12 of 30	Q2

Data from the 2017 edition of Journal Citation Reports

Publisher
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC, 445 HOES LANE, PISCATAWAY, NJ 08855-4141 USA

ISSN: 1939-1404
eISSN: 2151-1535

Research Domain
Engineering
Physical Geography
Remote Sensing
Imaging Science & Photographic Technology

Close Window

Figure 5.F

Figures 5.A – 5.F. Panorama des journaux à haut impact (Q1 & Q2) où les auteurs ont publié leurs travaux citant l'article

3. Citations de la publication dans Scopus

La publication est citée par onze (11) travaux référencés dans les bases de Scopus. Nous avons utilisé l'application « Harzing's Publish or Perish, version 6.34 » crée par Anne-Wil Harzing, Professeure en Management International à Middlesex University (UK). Cette application permet d'interroger plusieurs bases de données bibliographiques dont Scopus. Néanmoins, la consolidation manuelle a montré qu'au moins 18 travaux référencés dans Scopus, l'ont cité.

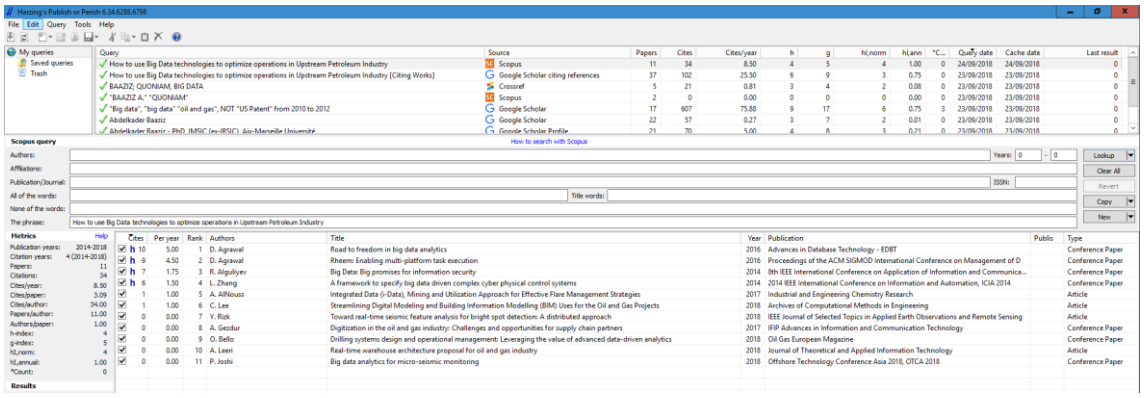


Figure 6. Interface de l'application « Harzing's Publish or perish » - Interrogation de la base « Scopus »

Ces résultats datent de 24/09/2018 et le nombre de citations a certainement augmenté. Malheureusement, la nouvelle version 7.17 du logiciel HPP, utilise une API de Scopus qui limite la recherche uniquement aux publications référencées sur les bases Scopus, ce qui n'est pas le cas de la nôtre. En effet, HPP permettait dans sa version antérieure (6.xx), une recherche par « auteur », « affiliations », « publication/journal », par inclusion ou exclusion de « mots clés » et par « phrase exacte ». C'est cette dernière qui nous a permis d'effectuer notre recherche sur le titre exacte de la publication citée *« How to use Big Data technologies to optimize operations in Upstream Petroleum Industry »*.

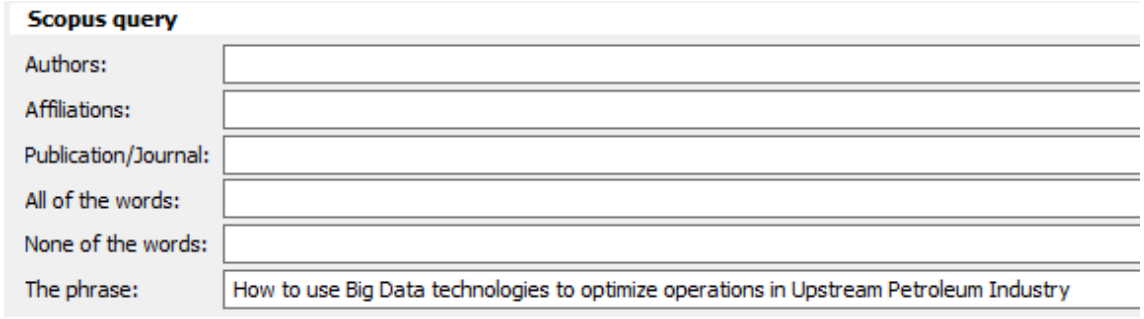
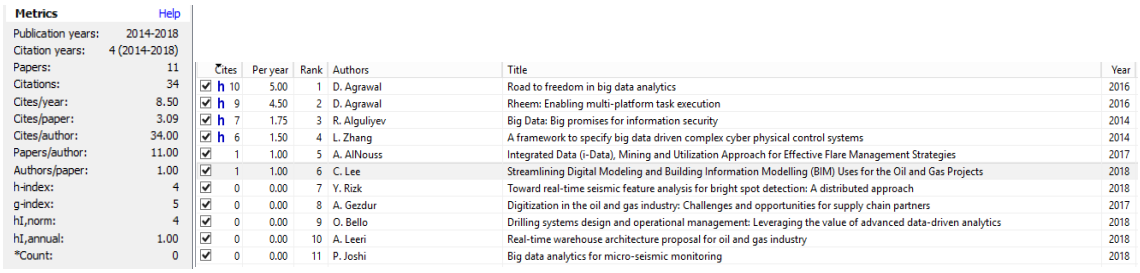


Figure 7. La requête « phrase exacte » introduite dans « Harzing's Publish or perish » pour interroger la base Scopus

Les résultats de cette requête montrent (figure 8), que notre publication a été cité par onze (11) publications référencées dans Scopus, dont :

- 3 publications dans des journaux de premier ordre Q1 ou Q2 dans leurs domaines respectifs :
  1. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (Q1 sur Scopus / Q2 sur JCR)
  2. Archives of Computational Methods in Engineering (Q1 sur Scopus & JCR)
  3. Industrial and Engineering Chemistry Research (Q1 sur Scopus & JCR)
- 7 papiers de conférences internationales reconnues :
  1. Offshore Technology Conference – Asia 2018, OTC-A 2018
  2. IFIP Advances in Information and Communication Technology 2017
  3. Advances in Database Technology – EDBT 2016
  4. ACM SIGMOD International Conference on Management of Data 2016
  5. IEEE International Conference on Application of Information and Communication Technologies, AICT 2014
  6. IEEE International Conference on Information and Automation, ICIA 2014



Metrics	Help
Publication years:	2014-2018
Citation years:	4 (2014-2018)
Papers:	11
Citations:	34
Cites/year:	8.50
Cites/paper:	3.09
Cites/author:	34.00
Papers/author:	11.00
Authors/paper:	1.00
h-index:	4
g-index:	5
hI,norm:	4
hI,annual:	1.00
*Count:	0

Cites	Per year	Rank	Authors	Title	Year
h 10	5.00	1	D. Agrawal	Road to freedom in big data analytics	2016
h 9	4.50	2	D. Agrawal	Rheem: Enabling multi-platform task execution	2016
h 7	1.75	3	R. Alguliyev	Big Data: Big promises for information security	2014
h 6	1.50	4	L. Zhang	A framework to specify big data driven complex cyber physical control systems	2014
1	1.00	5	A. AlNouss	Integrated Data (i-Data), Mining and Utilization Approach for Effective Flare Management Strategies	2017
1	1.00	6	C. Lee	Streamlining Digital Modeling and Building Information Modelling (BIM) Uses for the Oil and Gas Projects	2018
0	0.00	7	Y. Rizk	Toward real-time seismic feature analysis for bright spot detection: A distributed approach	2018
0	0.00	8	A. Gezdur	Digitization in the oil and gas industry: Challenges and opportunities for supply chain partners	2017
0	0.00	9	O. Bello	Drilling systems design and operational management: Leveraging the value of advanced data-driven analytics	2018
0	0.00	10	A. Leeri	Real-time warehouse architecture proposal for oil and gas industry	2018
0	0.00	11	P. Joshi	Big data analytics for micro-seismic monitoring	2018

Figure 8. Les résultats de la requête « phrase exacte » dans la base Scopus sur « Harzing's Publish or perish » (M-à-J du 24/09/2018)

4. Citations de la publication sur ResearchGate

La publication est citée par quarante-quatre (44) travaux référencés dans ResearchGate.

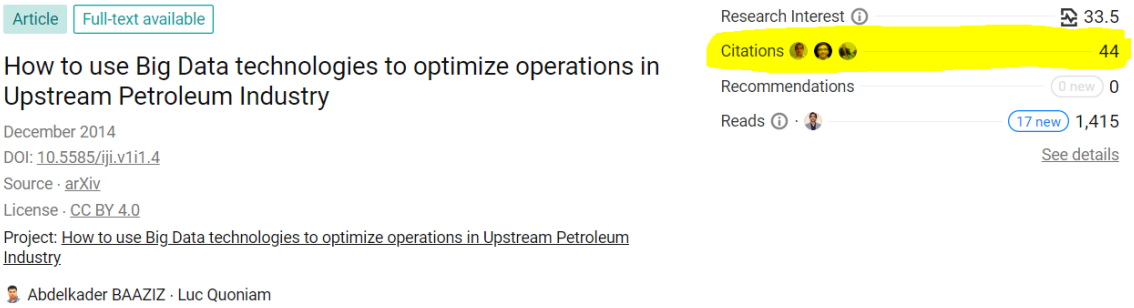


Figure 9. Aperçu des informations concernant notre publication sur ResearchGate (M-à-J du 18/01/2020)

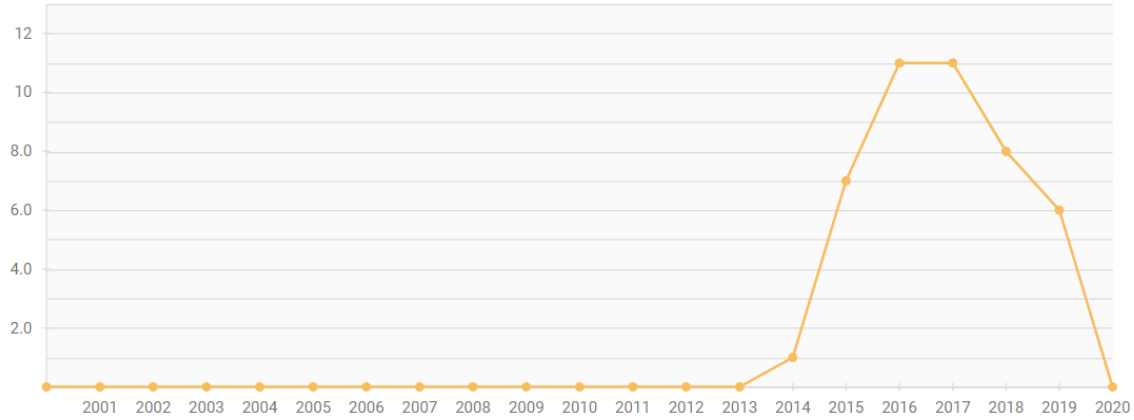


Figure 10. Evolution des citations de la publication sur ResearchGate (M-à-J du 18/01/2020)

5. Citations de la publication dans Google Scholar

La publication est citée par soixante-sept (67) travaux référencés sur Google Scholar.



Figure 11. La page Google Scholar de l'auteur « Abdelkader Baaziz » (M-à-J du 18/01/2020)

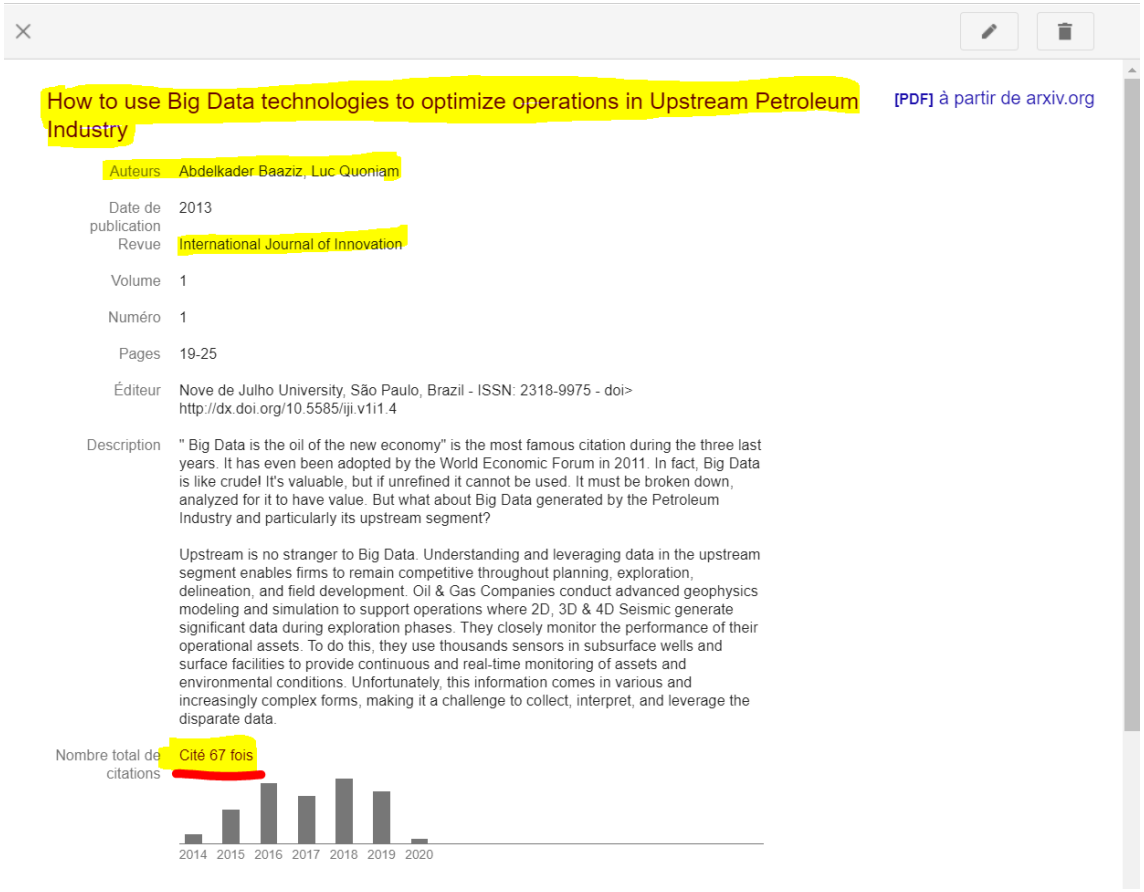


Figure 12. Fiche récapitulative précisant le nombre de citations et les statistiques des 5 dernières années sur Google Scholar (M-à-J du 18/01/2020)

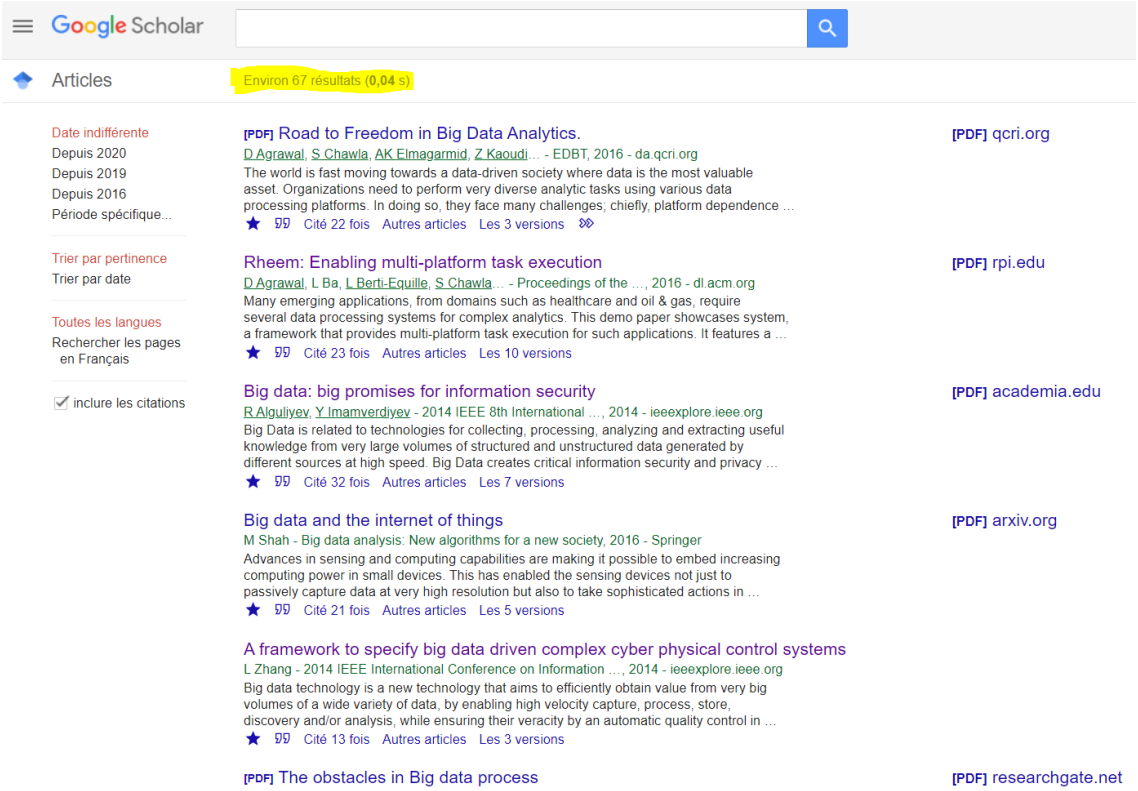


Figure 13. Un aperçu des résultats lorsqu'un clique est effectué sur le lien « nombre de citations » (M-à-J du 18/01/2020)

6. Récapitulatif des citations académiques

Le nombre total des citations de notre publication au 18/01/2020 est de 87 citations en tenant compte de l'ensemble des citations indexées par Google Scholar ainsi que les citations non énumérées Google Scholar mais se trouvant dans les bases WoS (au nombre de 10). Nous avons supprimé les citations en double (par exemple, lorsqu'il s'agit d'une version originale et sa traduction).

La rebrique « Autres Académiques » regroupe les publications académiques qui ont cité notre article mais qui ne sont pas indexées dans des bases. **Aucune « autocitation » n'est comptabilisée dans le décompte des citations. Il s'agit bien de citations de tiers auteurs.**

	Google Scholar	WoS	Scopus	ResearchGate	Autres Académ.	Autres Prof.
Nombre de Citations	**65**	25	>11 (18 ?)	44	04	06
Citations exclusives	-	**11**		**07**	**04**	**06**
Total des Citations	**87 = 65 + 11 + 07 + 04 (Voir listing complet en Annexe)**					**06**

Tableau 3. Récapitulatif des Citations sur Google Scholar, WoS, Scopus & ResearchGate (M-à-J du 18/01/2020)

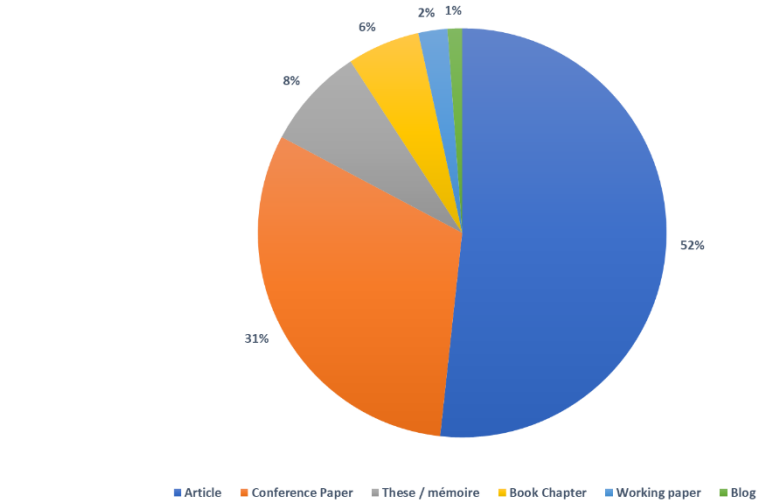


Figure 14. Répartition par types de publications citant notre publication (M-à-J du 18/01/2020)

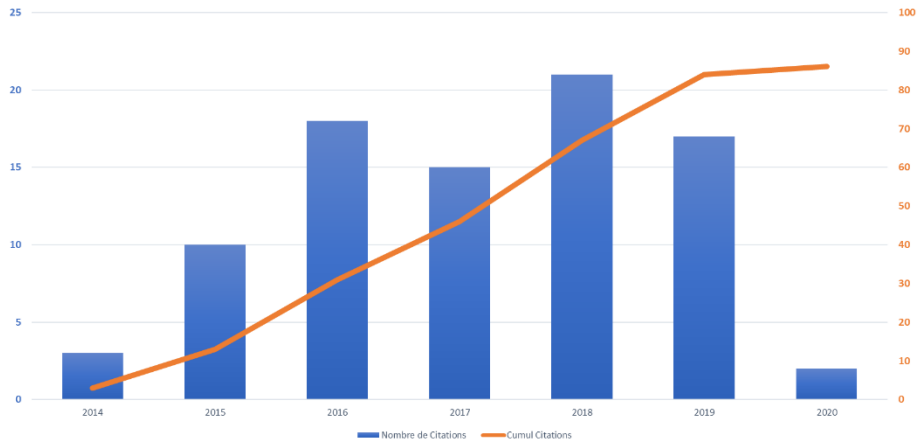


Figure 15. Evolution des citations entre 2014 et 2019

La majorité des publications sont parues dans des journaux académiques « peer review » ou des papiers de conférences internationales à proceedings édités par des célèbres éditeurs tels que Springer, IEEE Xplore, ACM Digital Library ou encore, OnePetro.

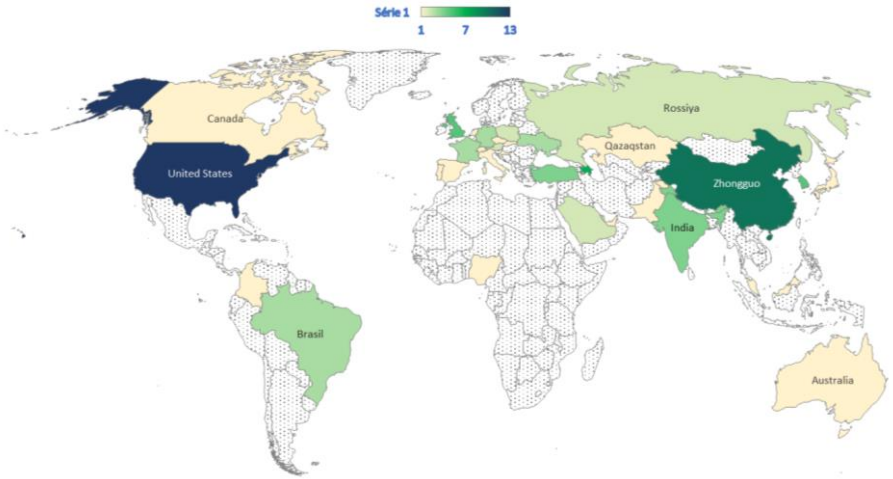


Figure 15. Répartition par Pays des publications citant notre publication (M-à-J du 18/01/2020)

Pour reconstituer la cartographie par pays des publications citant notre publication, nous avons considéré par souci de simplification :

- Le pays de localisation du journal dans le cas d'une publication académique,
- Le pays du lieu où s'est déroulée la conférence dans le cas des « conference papers »,
- Le pays de domiciliation de l'éditeur dans le cas des « book chapters »,
- Le pays où se situe l'institution de recherche à laquelle appartient l'auteur principal dans le cas des « working papers » et des « mémoires & thèses ».

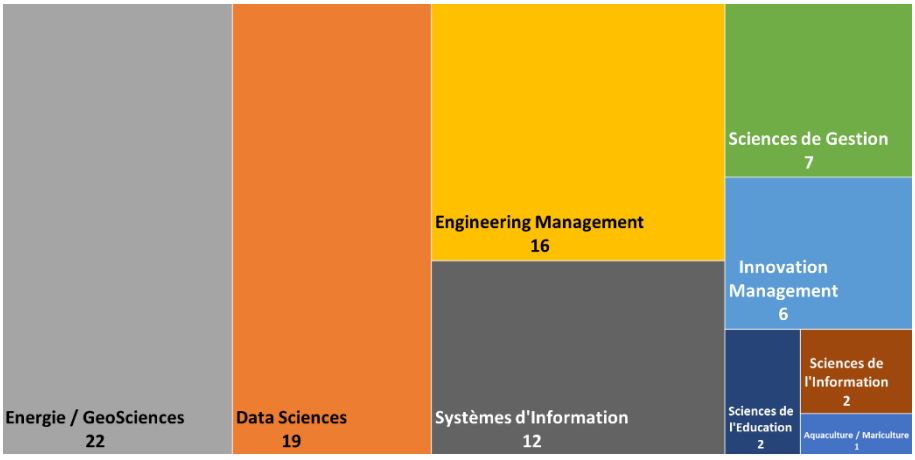


Figure 16. Répartition par champs disciplinaires des publications citant notre publication (M-à-J du 18/01/2020)

Cette représentation relativement exhaustive (figure 16) des champs disciplinaires des auteurs citant notre publication, confirme les résultats de l'échantillon bibliométrique des citations trouvées dans les bases du Web of Science. En effet, elle illustre parfaitement sa portée pluridisciplinaire.

7. Citations professionnelles de la publication

Deloitte, le cabinet conseil de renommée internationale a cité deux fois notre publication : "How to use Big Data technologies to optimize operations in Upstream Petroleum Industry".

La première citation dans Deloitte Insights (Review), un publication intitulée : “Connected barrels: Transforming oil and gas strategies with the Internet of Things. The Internet of things in the oil and gas industry” [(4)].

La seconde citation intervient pour désigner la publication (avec Berg Insights & Gartner) comme une des trois contributions de référence de l’analyse transformative [(5)] conduisant à un avantage axé sur la perspicacité.

Egypt Oil & Gas, site d'information égyptien spécialisé dans les technologies appliquées au pétrole et au gaz, publie en date du 7 mai 2017, une analyse de Mariana Somensi (Editrice en chef de Egypt Oil & Gas) intitulée “RESERVOIR RECOVERY INFRASTRUCTURE: A Key Investment for Output Boom” où il cite notre publication pour illustrer l’apport des Big Data [(6)] dans les opérations de production et d’exploitation tels que la prédiction des performances futures en fonction des résultats historiques ou identifier des zones de production inférieures à la normale pour transférer leurs actifs vers des zones plus productives et améliorer significativement les taux de récupération du pétrole.

“Society of Petroleum Engineers (SPE) – Italian Section” diffuse régulièrement un bulletin technique trimestriel dont le numéro 1/2017 qui a publié une synthèse de Maria Giulia De Donno (Ingénieure pétrole chez ENI), intitulée “Connected Barrels : IoT opportunities for the oil and gas industry” où elle cite notre publication pour montrer les apports tangibles des Big Data et des objets connectés à l’industrie pétrolière [(7)].

ABB, entreprise helvético-suédoise et acteur majeur des technologies de l’énergie et de l’automation [(8)], a publié un livre blanc intitulé “Digitalizing onshore wellheads, pipelines and terminals” [(9)] dont l’objectif est de partager avec les opérateurs onshore des réflexions et conseils afin d’orienter leurs efforts de numérisation du secteur en se basant sur ses propres expériences. Ce livre blanc reprend certaines réflexions que nous avons émises dans notre publication, afin d’optimiser les opérations, améliorer la prise de décision, réduire les temps non-productifs et réduire les risques pour les actifs et le personnel.

Global Energy Monitor est la publication officielle de Energy Governance & Security (EGS) qui a la charge de mener des études stratégiques de la Corée du Sud en matière de pénurie d'eau, pénuries d'énergie, pénuries alimentaires, de crise démographique, de problèmes environnementaux, de sécurité énergétique, de croissance verte et de durabilité environnementale. Elle est aussi, en charge d’élaborer une stratégie énergétique nationale de la Corée du Sud.

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[4] Slaughter, A.; Bean, G. et Mittal, A. (2015). “Connected barrels: Transforming oil and gas strategies with the Internet of Things. The Internet of things in the oil and gas industry”. Deloitte Insights (Review). Lien @ https://www2.deloitte.com/insights/us/en/focus/internet-of-things/iot-in-oil-and-gas-industry.html [Consulté le 20/01/2020]

[5] Mittal, N. (May 5, 2017). “Transformative analytics: Three steps toward an insight-driven advantage”. Deloitte Analytics. Lien @ https://www2.deloitte.com/us/en/pages/deloitte-analytics/articles/transformative-analytics.html [Consulté le 20/01/2020]

[6] Somensi, M. (May 5, 2017). “RESERVOIR RECOVERY INFRASTRUCTURE: A Key Investment for Output Boom”. Egypt Oil & Gas. Lien @ https://egyptoil-gas.com/features/reservoir-recovery-infrastructure-a-key-investment-for-output-boom/ [Consulté le 20/01/2020]

[7] De Donno, M. G. (2017). “Connected Barrels: IoT opportunities for the oil and gas industry”. SPE – Italian Section – Technical Bulletin 1/2017 (Mars 2017). Lien @ https://issuu.com/mychicjungle/docs/web_n4 [Consulté le 20/01/2020]

[8] ABB sur Wikipédia @ https://fr.wikipedia.org/wiki/ABB_(entreprise) [Consulté le 20/01/2020]

[9] ABB (2019). “Digitalizing onshore wellheads, pipelines and terminals”. Lien @ https://www.opuskinetic.com/wp-content/uploads/2019/06/ABB_Digitalizing-onshore-wellheads__pipelines_and_terminals.pdf [Consulté le 20/01/2020]

Elle publie dans son numéro de Janvier 2016, une étude intitulée : 초저유가시기의 생존전략, 디지털오일필드 (Stratégie de survie dans le cas des chutes extrêmes des prix du pétrole : Les gisements pétroliers à l'ère du numérique). Cette publication rédigée par Park Hee-won (PDG, Energy Holdings Group) [10], cite l'article "How to use big data technologies to optimize operations in upstream petroleum industry" en reprenant l'essentiel des concepts ainsi que les recommandations de mise en œuvre.



8. Récapitulatif global des citations académiques et professionnelles

Les citations académiques et professionnelles de notre publication, recensées à la date du 18/01/2020, sont au nombre de 93 citations. La figure 17 montre la répartition de ces citations. Le total des citations tient compte des redondances de présence dans diverses sources en les supprimant.

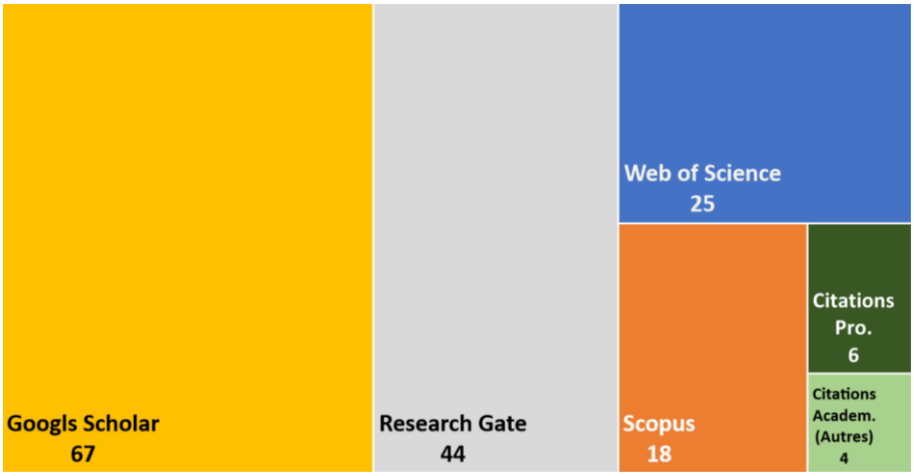


Figure 17. Récapitulatif général des diverses citations notre publication (M-à-J du 18/01/2020)

9. Conclusion

Bien que publiée dans une revue relativement récente (référencée dans WoS comme source émergeante), notre publication a eu un impact fort auprès des chercheurs de divers champs disciplinaires tant en sciences humaines qu'en sciences de l'ingénieur. Ceci souligne sa portée pluridisciplinaire dont l'objectif principal est de jouer un rôle de médiation scientifique et technique auprès des chercheurs et professionnels appartenant à un spectre pluridisciplinaire le plus large possible. Un objectif que nous estimons atteint au vu des résultats de cette modeste étude bibliométrique.

[10] Park Hee-won (2016). 초저유가시기의 생존전략, 디지털오일필드. Global Energy Monitor (Janvier 2016). Lien @ http://www.egskorea.org/admin/bbs/down.php?code=egs01&idx=5574&no=2 [Consulté le 20/01/2020]

Résumé en Français

Résumé en français de la publication :

How to use Big Data technologies to optimize operations in Upstream Petroleum Industry

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Comment utiliser les technologies des Big Data pour optimiser les opérations dans l'activité Amont de l'industrie pétrolière

1. Introduction

L'industrie pétrolière et gazière est un environnement extrêmement concurrentiel et hautement réglementé. Dans cet environnement incertain caractérisé par l'éternelle nécessité de renouveler les réserves de ressources naturelles tout en tenant compte de la fluctuation de la demande et des prix, les compagnies pétrolières et gazières doivent accroître leur production, optimiser les coûts et réduire l'impact des risques environnementaux.

Le secteur amont pétrolier est complexe et ses activités s'appuient essentiellement, sur la collecte et l'analyse des données en temps réel, dont les volumes sont en croissance exponentielle. Les compagnies de l'amont travaillent simultanément avec des données structurées et non structurées. Ils doivent collecter et gérer de plus en plus de données, les stocker, les analyser afin d'obtenir des informations utiles enfouillées dans la masse de données. Dans ces conditions, les outils d'analyse traditionnels sont incapables de les traiter d'où la nécessité d'infrastructures suffisamment dimensionnées (Mainframes, Cloud, etc.) et des outils appropriés (bases de données No-SQL, Big Data Analytics, etc.), les compagnies pétrolières et gazières pourraient tirer une valeur certaine et mesurable de ces données.

2. Définition de Big Data

La première définition du Big Data a été proposée par Meta Group (qui fait désormais partie de Gartner) en décrivant ses trois caractéristiques appelées « 3V » : Volume, Velocity et Variety. En insistant sur les aspects qualitatifs des données, IBM proposa un quatrième V dit Veracity. Cependant, Oracle soulignant la valeur ajoutée certaine de ces données, proposa un autre V dit Value.

La définition la plus populaire des Big Data, s'appuient sur ses six caractéristiques appelées « 6V » : Volume, Vélocité, Variété, Variabilité, Véracité et Valeur.

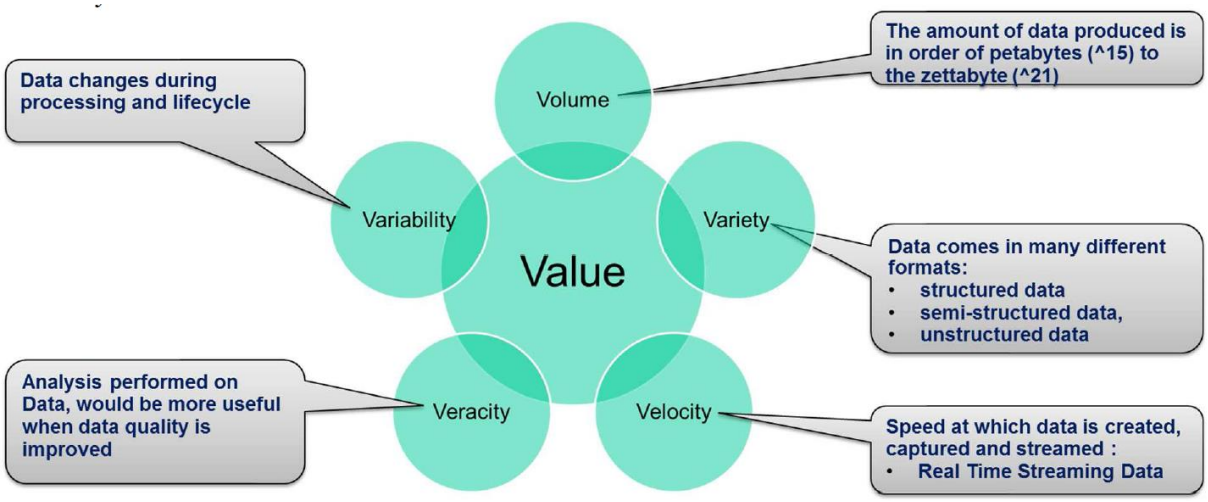


Figure 1. Les 6V du Big Data

Les technologies Big Data décrivent une nouvelle génération de technologies et d'architectures, conçues pour extraire de la valeur à partir de très gros volumes d'une grande variété de données, à travers un processus permettant la collecte, le stockage, le traitement et l'analyse à grande vitesse (en différé ou en temps réel) des données ainsi que la découverte des connaissances tout en assurant leur véracité par un contrôle de qualité systématique et automatique.

Ces technologies reposent essentiellement sur le projet Apache ™ Hadoop®, un projet open source de traitement distribués fiable et évolutif.

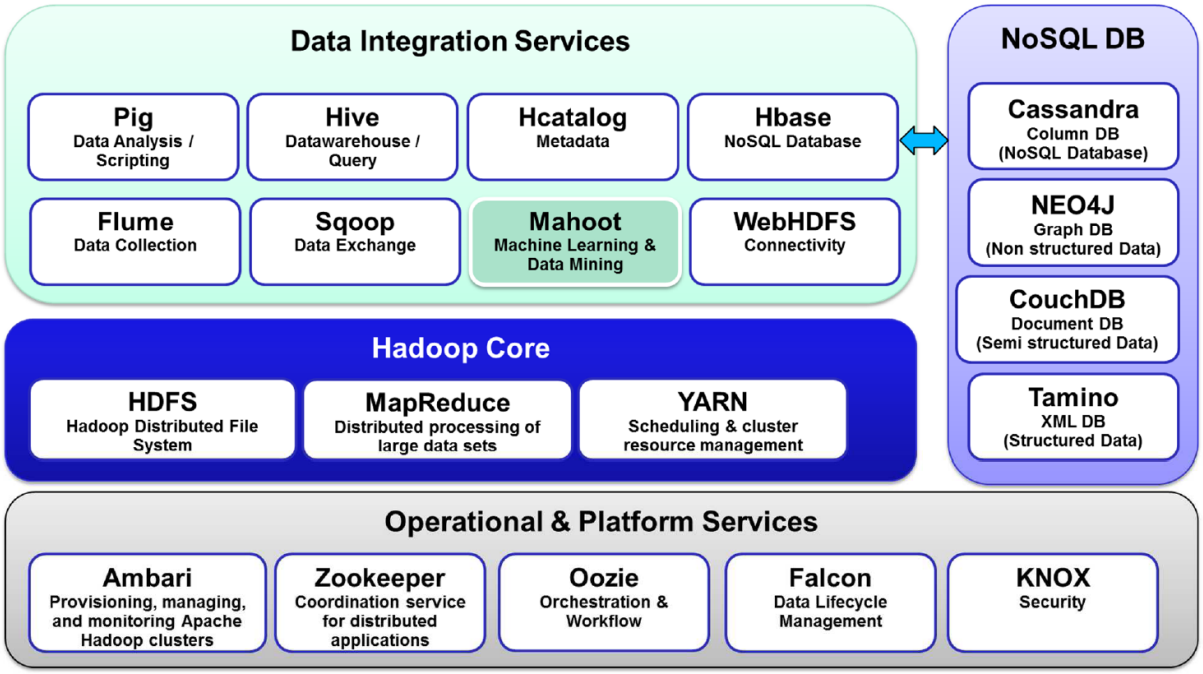


Figure 2. Technologies Big Data basées sur l'écosystème Hadoop (Hadoop est un projet Open source)

3. Big Data dans le secteur amont du pétrole et du gaz

Le secteur de l'amont pétrolier n'est pas étranger au Big Data et à l'Internet des objets (IoT). Les opérateurs de ce secteur utilisent régulièrement, des milliers de capteurs installés dans des puits en subsurface et des installations de surface afin de fournir une surveillance des actifs et des données qu'ils génèrent en continue et en temps réel.

Les volumes de données proviennent de capteurs et de divers appareils de mesure. Les données « structurées » sont gérées avec des applications spécifiques utilisées pour manager la planification de l'exploration, la modélisation des réservoirs, la production et d'autres activités de l'amont. Mais une grande partie de ces données sont « non structurées » ou « semi-structurées » telles que les fichiers de journalisation (logs) et d'imagerie qui doivent être manipulés avec des outils appropriés pour le Big Data.

Pour prendre en charge la prise de décision opérationnelle en temps réel, les compagnies pétrolières et gazières ont besoin d'outils intégrant diverses sources de données dans un ensemble unifié. Elles doivent être capables de traiter les Big Data afin de visualiser (la visualisation est appelée le 7ème V), les relations qui apparaîtraient lorsque toutes ces sources sont traitées dans leur ensemble (Matching). Mais pour libérer cette valeur, les compagnies pétrolières et gazières doivent avoir accès aux technologies, aux outils et aux expertises appropriés.

Comme les Big Data génériques, les données amont sont également caractérisées par le 6V :

	Exploration	Resevoir Engineering & Development	Drilling and Completion	Production
Volume	Seismic acquisition SEGD	Facilities Reservoir Engineering	Sensors : Flow Pressure ROP	SCADA Sensors : Flow Pressure
Variety	Structured data : • SEGD • Pre-stack • Post-stack Semi-structured : • Implantation Report …	Structured data : • WITSML (XML) • PRODML • RESML Unstructured data : • Log Curves / Drilling & Test / Lithology /Cores …	Structured : • WITSML Semi-structured : • Final Well Report, • Daily Drilling Report Unstructured : • Drilling Log / Gas Log .. etc.	Structured Production data : • PRODML • RESML Semi-structured : • Crude Analysis Report
Velocity	Real Time Data Acquisition : Wide azimuth data acquisition		Real Time Data Acquisition : Mud Logging / LWD / MWD	Real Time Data Acquisition : SCADA Sensors
Veracity	Seismic processing	Reservoir Modeling	Sensor calibration	Sensor calibration
Variability	Seismic Interpretation Geology Interpretation	Reservoir Simulation Combination of seismic, drilling and production data	Data Interpretation & Optimisation	Data Interpretaion
Value	**Navigation, Visualization & Discovery Run integrated asset models**	**Improve Drilling Program Drive innovation with unconventional resources (shale gas, tight oil)**	**Reduce costs Reduce Non Productive Time (NPT) Reduce risks Improve HSE performances**	**Increase speed to first oil Enhancing production**

Figure 3. Big Data dans l'Amont pétrolier

Les compagnies pétrolières et gazières devraient tirer parti de leurs centres de recherche et développement (R&D) et/ou collaborer étroitement avec des centres indépendants existants pour explorer le potentiel des Big Data afin de résoudre les problèmes et difficultés techniques rencontrés au quotidien lors des opérations et capitaliser les connaissances afin d'améliorer leurs performances. Elles doivent dans ce cas prendre en compte les exigences d'un environnement collaboratif partagé qui prend en charge la totalité du flux de production des groupes de travail.

Pour résoudre ces problèmes, les groupes de travail R & D devraient avoir un œil permanent sur la richesse des données contenues dans les bases de données brevets. Ces bases de données sont des sources ouvertes « Open Big Data ».

L'étape traditionnelle du prétraitement des données (étape de nettoyage des données dans le traitement de l'information conventionnel) devrait être banni lors du traitement des grands volumes de données géophysiques et géologiques (et dans d'autres domaines autre que pétrolier). Souvent, le biais cognitif aidant (notamment le biais de l'illusion de savoir), nous excluons toutes les données qui ne correspondent pas à notre cadre établi de références scientifiques. En conséquence, nous manquons l'occasion de découvrir et de visualiser de nouveaux phénomènes jusque-là, inexpliqués.

Le Big Data contribue de manière significative à réduire les risques et à optimiser les coûts liés aux opérations et à la santé, la sécurité et l'environnement, nous citerons à titre non-exhaustif :

- Prévenir des événements indésirables lors des forages tels que les irruptions du puit,
- Prévoir les opérations de maintenance des appareils de forage en fonction de leur planning de disponibilité/indisponibilité, optimiser les paramètres de forage et prévenir les accidents liés aux éruptions,
- Utiliser les données de la météo pour la planification des effectifs pour éviter des conditions dangereuses aux travailleurs et atténuer les risques environnementaux.

4. Conclusion

Les principales compagnies pétrolières et gazières ont déjà lancé des projets de déploiement de technologies Big Data leurs permettent de suivre de nouvelles opportunités techniques ou commerciales, à réduire leurs coûts et à réorganiser leurs opérations.

En reconnaissant la valeur des actifs de données inexploités dans la prise de décision basée sur des faits, les compagnies pétrolières et gazières établissent de véritables cas d'utilisation des Big Data. Elles peuvent ensuite créer une valeur commerciale améliorée basée sur l'innovation et générer un avantage concurrentiel durable.

Les compagnies pétrolières et gazières doivent procéder à une analyse des écarts en moyens, en connaissances et en compétences, afin de déterminer les principales exigences du personnel spécialisé en matière de technologie et de gestion des données. Cela permet un investissement ciblé dans des technologies matures, éprouvées et capables de faire face à la croissance exponentielle des volumes de données.

Les compagnies pétrolières et gazières doivent créer de nouvelles stratégies qui les aideraient à manipuler ces données et à les utiliser pour assister les experts dans leurs processus métier et les gestionnaires dans leur processus de prise de décision.

Texte intégral de la Publication
(Version auteur)

How to use Big Data technologies to optimize operations in Upstream Petroleum Industry

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Abstract

"Big Data is the oil of the new economy" is the most famous citation during the three last years. It has even been adopted by the World Economic Forum in 2011. In fact, Big Data is like crude! It's valuable, but if unrefined it cannot be used. It must be broken down, analyzed for it to have value.

But what about Big Data generated by the Petroleum Industry and particularly its upstream segment?

Upstream is no stranger to Big Data. Understanding and leveraging data in the upstream segment enables firms to remain competitive throughout planning, exploration, delineation, and field development.

Oil & Gas Companies conduct advanced geophysics modeling and simulation to support operations where 2D, 3D & 4D Seismic generate significant data during exploration phases. They closely monitor the performance of their operational assets. To do this, they use tens of thousands of data-collecting sensors in subsurface wells and surface facilities to provide continuous and real-time monitoring of assets and environmental conditions. Unfortunately, this information comes in various and increasingly complex forms, making it a challenge to collect, interpret, and leverage the disparate data. As an example, Chevron's internal IT traffic alone exceeds 1.5 terabytes a day.

Big Data technologies integrate common and disparate data sets to deliver the right information at the appropriate time to the correct decision-maker. These capabilities help firms act on large volumes of data, transforming decision-making from reactive to proactive and optimizing all phases of exploration, development and production. Furthermore, Big Data offers multiple opportunities to ensure safer, more responsible operations. Another invaluable effect of that would be shared learning.

The aim of this paper is to explain how to use Big Data technologies to optimize operations. How can Big Data help experts to decision-making leading the desired outcomes?

Keywords

Big Data; Analytics; Upstream Petroleum Industry; Knowledge Management; KM; Business Intelligence; BI; Innovation; Decision-making under Uncertainty

How to use Big Data technologies to optimize operations in Upstream Petroleum Industry

I. Introduction

The Oil & Gas industry is extremely competitive and highly regulated environment. Against this uncertain environment characterized by the eternal necessity to renewal reserves of natural resources, fluctuating demand and price volatility, Oil & Gas companies need to increase production, optimize costs and reduce the impact of environmental risks.

Oil & Gas upstream sector is complex, data-driven business with data volumes growing exponentially (Feblowitz, 2012). Upstream organizations work simultaneously with both structured and unstructured data. They must capture and manage more data than ever and are struggling to store, analyze and get useful information from these huge volumes of data. Under these conditions, the traditional analysis tools would fail but with the appropriate infrastructure and tools, Oil & Gas companies can get measurable value from these data.

The aim of this paper is to show how Big Data can be used to gain valuable operational insight in the Oil & Gas industry and to assist in decision-making in different activities of its upstream sector.

II. Big Data Definition

The first definition of Big Data was developed by Meta Group (now part of Gartner) by describing their three characteristics called "3V": Volume, Velocity and Variety. Based on data quality, IBM has added a fourth V called: Veracity. However, Oracle has added a fourth V called: Value, highlighting the added value of Big Data (Baaziz & Quoniam, 2013a).

Big Data is defined by six characteristics called "6V": Volume, Velocity, Variety, Variability Veracity and Value.

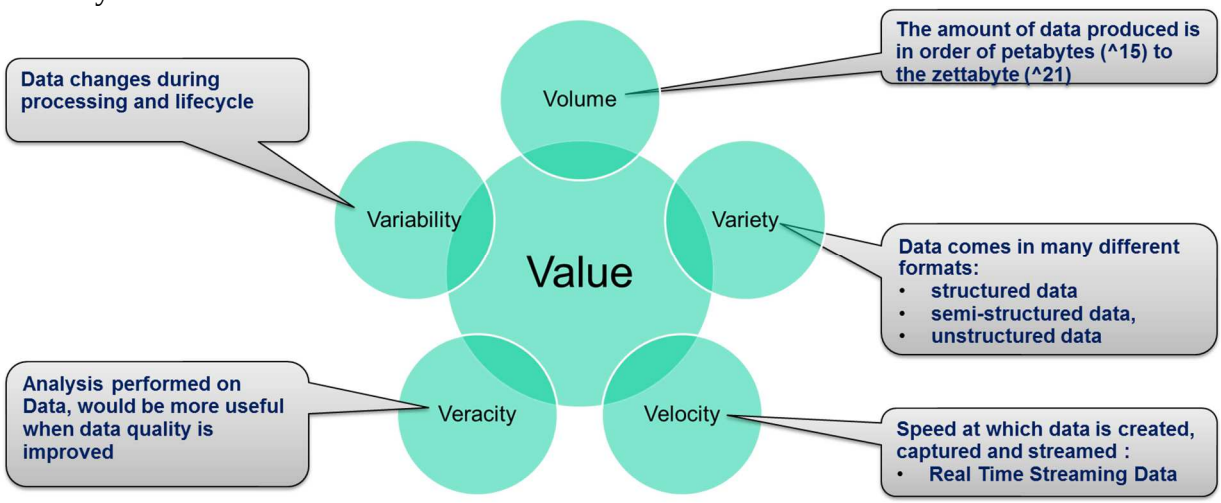


Fig. 1. The "6V" of Big Data

"Big Data technologies describe a new generation of technologies and architectures, designed to economically extract value from very large volumes of a wide variety of data, by enabling

high velocity capture, discovery and/or analysis (Feblowitz, 2012), while ensuring their veracity by an automatic quality control in order to obtain a big value".

These technologies are essentially based on the Apache™ Hadoop® project that's open-source software for reliable, scalable, distributed computing (Hadoop, 2013).

The Apache Hadoop software library is a framework that allows for the distributed processing of large data sets across clusters of computers using simple programming models. It is designed to scale up from single servers to thousands of machines, each offering local computation and storage. Rather than rely on hardware to deliver high-availability, the library itself is designed to detect and handle failures at the application layer, so delivering a highly-available service on top of a cluster of computers, each of which may be prone to failures (Hadoop, 2013).

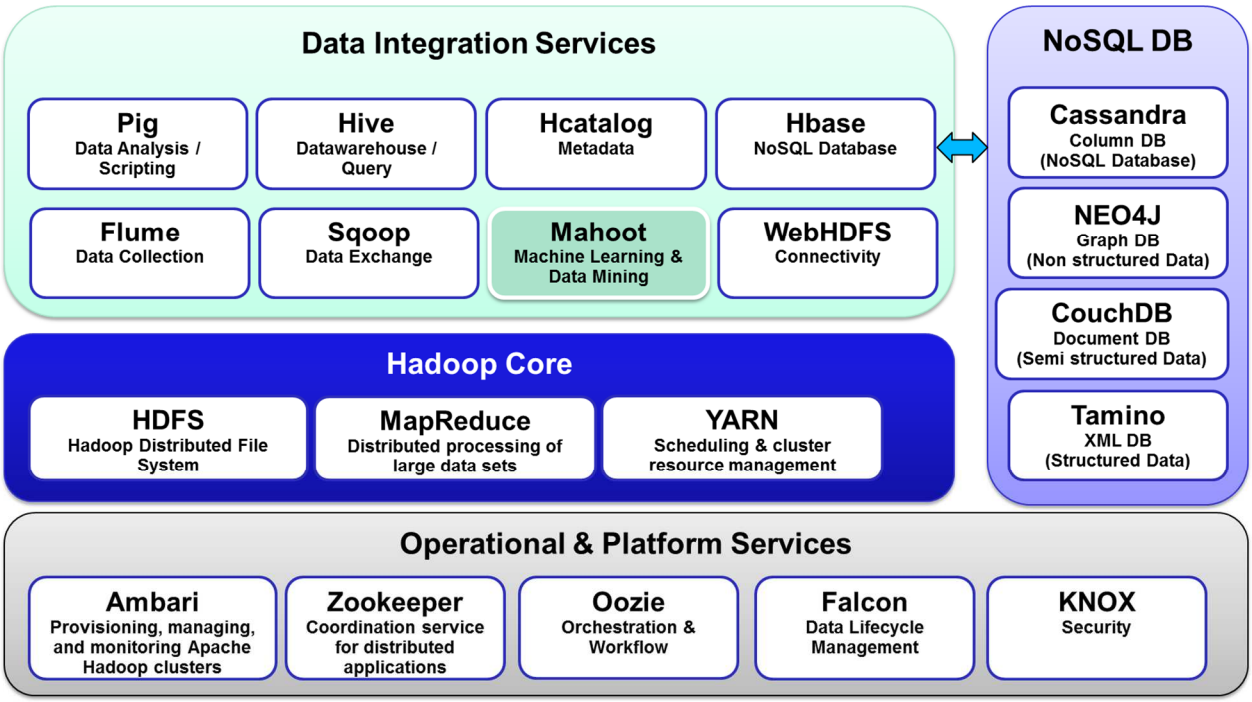


Fig. 2. Big Data technologies are based on Hadoop Ecosystem (Hadoop is an Open source project)

III. Big Data in the Oil & Gas Upstream Sector

1. Overview

Upstream is no stranger to Big Data. Oil & Gas companies use thousands of sensors installed in subsurface wells and surface facilities to provide continuous data-collecting, real-time monitoring of assets and environmental conditions (Brulé, 2013).

The data volume is coming from sensors, spatial and GPS coordinates, weather services, seismic data, and various measuring devices. "Structured" data is handled with specific applications used to manage surveying, processing and imaging, exploration planning, reservoir modeling, production, and other upstream activities. But much of this data is "unstructured" or "semi-structured" such as emails, word processing documents, spreadsheets, images, voice recordings, multimedia, and data market feeds, which means it's difficult or costly to either store in traditional data warehouses or routinely query and analyze. In this case, appropriate tools for Big Data should be used (Hems & al., 2013).

To support the real-time decision-making, Oil & Gas companies need tools that integrate and synthesize diverse data sources into a unified whole. Being able to process Big Data makes it possible to derive insight from the relationships that will surface when all of these sources are processed as a whole. But to unlock this value, Oil & Gas companies need access to the appropriate technology, tools, and expertise (Baaziz & Quoniam, 2013a).

Like generic Big Data, the Upstream Data is also characterized by the 6V:

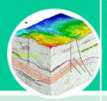
	Exploration 	Resevoir Engineering & Development 	Drilling and Completion  	Production 
Volume	Seismic acquisition SEGD	Facilities Reservoir Engineering	Sensors : Flow Pressure ROP	SCADA Sensors : Flow Pressure
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Fig. 3. Upstream Big Data

2. Big Data Still in experimental stage in Oil & Gas Industry

Work on the application of Big Data and Analytics in the Oil & Gas industry is in the experimental stage (Feblowitz, 2012). Only a handful companies have adopted Big Data in the field (Nicholson, 2013):

- Chevron proof-of-concept using Hadoop (IBM BigInsights) for seismic data processing ;
- Shell piloting Hadoop in Amazon Virtual Private Cloud (Amazon VPC) for seismic sensor data ;
- Cloudera Seismic Hadoop project combining Seismic Unix with Apache Hadoop ;
- PointCross Seismic Data Server and Drilling Data Server using Hadoop and NoSQL ;
- University of Stavanger data acquisition performance study using Hadoop.

Much of the software innovation that's key to the digitization of big oil is happening at oil service contracting companies, such as Halliburton and Schlumberger, and big IT providers including Microsoft, IBM, Oracle and Open Source Projects.

3. Exploration and Development

By combination of Big Data and advanced analytics in Exploration and Development activities, managers and experts can perform strategic and operational decision-making.

The areas where the analytics tools associated with Big Data can benefit Oil & Gas exploration include:

- **Enhancing exploration efforts:** Historical drilling and production data help geologists and geophysicists verify their assumptions in their analysis of a field where environmental regulations restrict new surveys (Feblowitz, 2012). Combine enterprise data with real-time production data to deliver new insights to operating teams for enhancing exploration efforts (Hems & al, 2013).
- **Assessing new prospects:** Create *competitive intelligence* using Analytics applied to geospatial data, oil and gas reports and other syndicated feeds in order to bid for new prospects (Hems & al, 2013).
- **Identifying seismic traces:** Using advanced analytics based on Hadoop and distributed Database for storage, quick visualization and comprehensive processing and imaging of seismic data (Seshadri, 2013) to identify potentially productive seismic trace signatures previously (Hems & al., 2013).
- **Build new scientific models:** By using high performance computing and based on combination between "historical data" and "Real Time Data Acquisition": Petabyte seismic data sets, Mud Logging, MWD, LWD, Testing, Gamma Ray (Nicholson, 2013) & (Seshadri, 2013).

4. Drilling and Completion

Making the drilling platforms and pipeline infrastructure smart to anticipating issues and acting to prevent failures and increase productivity (Seshadri, 2013). In this case, Big Data is used to identify conditions or anomalies that would impact on drilling operations can save human lifes and equipments. Real-time information returned from supervisory control and data acquisition systems on well-heads can be used to grasp opportunities that maximize asset performance and optimize production (Hems & al, 2013).

Related areas where analytics can improve drilling and completion operations:

- **Build and assessment of drilling models:** based on all existing well data. These models are incorporated with geologic measurement into drilling processes, such as shale development (Hems &al., 2013). This will refresh models based on incoming sensor data from drill rig and help to optimize drill parameters.
- **Improve Drill Accuracy and Safety:** by early identifying anomalies that would impact drilling and prevent undesired events: kicks, blowout, etc.
- **Drilling optimization:** predictive Analytics help to reduce NPT, by early identifying the negative impacting factors of drilling operations.
- **Cost optimization:** by using scalable compute technologies to determine optimum cost.
- **Real-time decision-making:** must act in real time on drilling data and formation evaluation data and use this data for predictive modeling to facilitate real-time decision-making.
- **Predictive maintenance:** predict drill maintenance/downtime.

5. Production

Big Data is of great interest to production and operation work. Being able to predict future performance based on historical results, or to identify sub-par production zones, can be used to shift assets to more productive areas. Oil recovery rates can be improved, as well, by integrating and analyzing seismic, drilling, and production data to provide self-service business intelligence to reservoir engineers.

- **Enhanced oil recovery:** Enhancing oil recovery from existing wells is a key objective for oil and gas companies. Analytics applied to a variety of Big Data at once – seismic, drilling, and production data – could help reservoir engineers map changes in the reservoir over time and provide decision support to production engineers for making changes in lifting methods. This type of approach could also be used to guide fracking in shale gas plays (Feblowitz, 2012).
- **Performance forecasting:** Forecast production at thousands of wells. Aging wells where the forecast does not meet a predetermined production threshold are flagged for immediate remediation (Feblowitz, 2012).
- **Real-time production optimization:** Real-time SCADA and process control systems combined with analytics tools help Oil & Gas producer to optimize resource allocation and prices by using scalable compute technologies to determine optimum commodity pricing. They also, help to make more real time decisions with fewer engineers (Hollingsworth, 2013).
- **Improve Safety and prevent risks:** by early detecting well problems before they become serious – slugging, WAG gas breakthrough.

6. Equipment maintenance:

Predictive maintenance is not a new concept for the oil and gas industry, although if you ask a maintenance executive, it does not get the attention and budget it deserves. In upstream, if pressure, volume, and temperature can be collected and analyzed together and compared with the past history of equipment failure, advanced analytics can be applied to predict potential failures. Additionally, many upstream operations are in remote locations or on ships, so being able to plan maintenance on critical assets is important, especially if work requires purchase of specialized equipment (Feblowitz, 2012).

Technicians often use data collected from pumps and wells to adjust repair schedules and prevent or anticipate failure. Better predictive maintenance also becomes possible (Hems & al., 2013):

- **Preventing down time:** Understand how maintenance intervals are affected by variables such as pressure, temperature, volume, shock, and vibration to prevent failure and associated downtime.
- **Optimizing field scheduling:** Use this insight to predict equipment failures and enable teams to more effectively schedule equipment maintenance in the field.
- **Improving shop floor maintenance planning:** Integrate well and tool maintenance data with supply chain information to optimize scheduling of shop floor maintenance.

7. Reservoir Engineering

Oil & Gas companies improve understanding of future strategy based on available oil for a better identification of reservoirs and reserves by integrate real-time data into the earth model both on the rig and in the office.

Also, they predict the chances of success of turning reservoir into a production well by:

- **Improving engineering studies:** engage sophisticated subsurface models and conduct detailed engineering studies on wells to identify commercial prospects earlier and with less risk (Feblowitz, 2012).
- **Optimizing subsurface understanding:** Use Big Data tools to understand the earth's subsurface better and to deliver more affordable energy, safely and sustainably.
- **Experiences and learned lessons from drilling operations:** such determination of drilling coordinates through oil shale to optimize the number of wellheads needed for efficient extraction of oil, optimization of drilling resources by not over drilling well site, reducing waste of drilling exploration wells, etc.

8. Research & Development

Oil & Gas companies should take advantage of their Research & Development Centers (CRD) or through close collaboration with existing independent centers to explore the potential of Big Data to resolve problems and technical difficulties they encounter in daily operations and capitalize knowledge to improve performance. They must in this case, taking into account the requirements of a shared collaborative environment that supports the flow of total production of the working groups.

To solve problems, R&D workgroups should have permanent eye on the wealth of data contained in the patent databases to be inspired particularly as these databases are considered as Open Big Data.

Patents are a unique and invaluable source for R&D because the information they contain, are generally not published elsewhere. In addition, they have a limited duration after which they can be operated without rights. They can also be fallen (for non-payment of annuities, for example) and may in this case be used freely. Finally, they may only be published in certain countries and thus they are not extended to other, hence the possibility to freely operate in these countries (Baaziz & Quoniam, 2013b).

The automatic patent analysis involves using information contained in a patent by analytics software in order to present outcomes by facilitating up the work of experts to understand developments, actors and subjects appearing in the research (Baaziz & Quoniam, 2013b).

It thus shows the correlations needed to answer common questions (Baaziz & Quoniam, 2013b):

- Importance of the subject and its evolution over time,
- Different technologies and applications involved,
- Who does what? How? (automatic benchmarking of companies),
- What are the trends in research and applications by applicants, inventors, inventors group or country,
- Etc.

Understand the importance of patent information and its proper use at the right time to reduce risks related to operational activities in uncertain environments (Baaziz & Quoniam, 2003b) like developing strategy to address critical design issues or analyzing root causes of design flaw in engineering projects. (Seshadri, 2013).

9. Data Management

Big Data and analytics include infrastructure, data organization and management, analytics and discovery for decision support. Infrastructure includes the use of industry-standard servers, networks, storage, and clustering software used for scale-out deployment of Big Data technology. Data organization and management refers to software that processes and prepares all types of data for analysis (Feblowitz, 2012).

10. Security

Oil & Gas companies anticipate IT security breaches by using predictive analytics and bolstering security with data from the global protection systems including video monitoring, access control et anti-intrusion.

Also, there is particular interest in deploying complex event processing (CEP) technology to monitor security concerns in the Oil & Gas industry in real time by (Hems & al., 2013):

- Combining data from multiple sources to infer events or patterns that indicate a current or imminent threat.
- Making faster decisions, supported by faster delivery of decision support information, to identify possible threats.
- Predict/prevent cyber-terror acts.

11. Health, Safety & Environment

Big Data contributes significantly to reduce risk and optimize costs related to operations and Health, Safety and Environment (Baaziz & Quoniam, 2013b):

- Prevent undesired events while drilling like kicks,
- Predict drill maintenance/downtime, optimize drill parameters and prevent blowout accidents,
- Using weather or workforce scheduling data to avoid creating dangerous conditions for workers and mitigating environmental risks.

IV. Conclusion

Leading Oil & Gas companies are already began projects to deploying Big Data technologies that can help them track new business opportunities, reduce costs and reorganize operations.

By recognizing the value of the unexploited data assets in supporting fact-based decision-making, Oil & Gas companies establish real cases of Big Data uses. Then they can create enhanced business value based on innovation and able to lead towards a sustainable competitive advantage.

Oil & Gas companies must first proceed to a gap analysis to determine the major requirements of technology and data-management expert staff. This allows a focused investment in mature and proven technologies as well as those who will face the exponential growth of data volumes.

Oil & Gas companies must create new strategies that will help them manipulate these data and use them to support experts in their business process and managers in their decision-making process.

References

Baaziz A., Quoniam L., 2013a, How to use Big Data technologies to optimize operations in Upstream Petroleum Industry, International Journal of Innovation (IJI), Vol. 1 No. 1, Dec. 2013

Baaziz A., Quoniam L., 2013b, The information for the operational risk management in uncertain environments: Case of Early Kick Detection while drilling of the oil or gas wells, International Journal of Innovation and Applied Studies (IJIAS), Vol. 4 No. 1, Sep. 2013

Brulé M., 2013, Tapping the power of Big Data for the oil and gas industry, IBM Software White Paper for Petroleum Industry, May 2013

Feblowitz J., 2012, The Big Deal About Big Data in Upstream Oil and Gas, Paper & presentation, IDC Energy Insights, October 2012

Hadoop, 2013, What Is Apache Hadoop?, Apache™ Hadoop® Website, Available at: http://hadoop.apache.org/#What+Is+Apache+Hadoop%3F , last update: 25 August 2013

Hems A., Soofi A., Perez E., 2013, Drilling for New Business Value: How innovative oil and gas companies are using Big Data to outmaneuver the competition, A Microsoft White Paper, May 2013

Hollingsworth J., 2013, Big Data For Oil & Gas, Oracle Oil & Gas Industry Business Unit, March 2013

JDN, 2013, Panorama des solutions de BIG DATA : Hadoop et son écosystème, Journal du Net, Available at: http://www.journaldunet.com/developpeur/outils/les-solutions-du-big-data/hadoop-et-son-ecosysteme.shtml, last update : 04 July 2013

Nicholson R., 2012, Big Data in the Oil & Gas Industry, IDC Energy Insights, September 2012

Seshadri M., 2013, Big Data Science Challenging The Oil Industry, CTO Global Services, EMC Corporation, March 2013

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Annexes

Num	Authors	Title	Year	Source	Publisher	Type	Pays	DOI / ISSN / ISBN	Discipline	Bases
1	Q Xue	Prospect of Big Data Application in Drilling Engineering	2020	Data Analytics for Drilling Engineering	Springer	Book Chapter	Chine	https://link.springer.com/chapter/10.1007/	Energie / GeoSciences	Google Scholar
2	Q Xue	Data Analytics for Drilling Engineering: Theory, Algorithms, Experiments, Software	2020	Information Fusion and Data Science	Springer	Book Chapter	Chine	https://books.google.com/books?hl=en&lr=	Energie / GeoSciences	Google Scholar
3	R Sarrakh, R Suresh, S Suresh, S Al Nabt	Smart solutions in the oil and gas industry: A review	2019	Journal of Clean Energy Technologies	wlv.openrepository.com	Article	Singapour	https://wlv.openrepository.com/handle/24	Energie / GeoSciences	Google Scholar
4	Y YELDAN	IMPLEMENTING REAL-TIME DATA ANALYTICS METHODS FOR PREDICTIVE MANUFACTURING IN OIL AND GAS INDUSTRY: FROM THE PERSPECTIVE …	2019	Middle East Technical University (METU) repository	etd.lib.metu.edu.tr	These / mémoire	Turquie	http://etd.lib.metu.edu.tr/upload/1262368	Engineering Management	Google Scholar
5	LA Rahim, KM Kudiri, S Bahattacharjee	Framework for parallelisation on big data	2019	PloS one	journals.plos.org	Article	USA	https://journals.plos.org/plosone/article?id	Data Sciences	Google Scholar
6	J Lu, I Holubová	Multi-model Databases: A New Journey to Handle the Variety of Data	2019	ACM Computing Surveys (CSUR)	dl.acm.org	Article	USA	https://dl.acm.org/citation.cfm?id=3323214	Data Sciences	Google Scholar
7	CY Lee	Integrative Trust-Based Functional Contracting: A Complementary Contractual Approach to BIM-Enabled Oil And Gas EPC Project Delivery	2019	Curtin University Repository	espace.curtin.edu.au	These / mémoire	Australia	https://espace.curtin.edu.au/handle/20.50(	Engineering Management	Google Scholar
8	M Al-Ghazal, V Vedpathak	A Novel Machine Learning Model for Early Operational Anomaly Detection Using LWD/MWD Data	2019	International Petroleum Technology Conference (IPTC)	onepetro.org	Conference Paper	KSA	https://www.onepetro.org/conference-pap	Energie / GeoSciences	Google Scholar
9	M Song, X Zhou	A Casing Damage Prediction Method Based on Principal Component Analysis and Gradient Boosting Decision Tree Algorithm	2019	SPE Middle East Oil and Gas Show and Conference	onepetro.org	Conference Paper	Chine	https://www.onepetro.org/conference-pap	Energie / GeoSciences	Google Scholar
10	HC Chan	An automated methodology for rapid information extraction from large drilling datasets	2019	The University of Texas at Austin Repository	repositories.lib.utexas.edu	These / mémoire	USA	https://repositories.lib.utexas.edu/handle/	Engineering Management	Google Scholar
11	I Manikas, B Sundarakani, …	Time-based responsive logistics for a maintenance service network: A case study of an automated teller manufacturer	2019	Journal of Quality in Maintenance Engineering	emeraldinsight.com	Article	USA	https://www.emeraldinsight.com/doi/abs/1	Engineering Management	Google Scholar
12	MJ Atamanczuk, A Siatkowski	INDÚSTRIA 4.0: O PANORAMA DA PUBLICAÇÃO SOBRE A QUARTA REVOLUÇÃO INDUSTRIAL NO PORTAL SPELL	2019	Future Studies Research Journal: Trends and Strategies	futurejournal.org	Article	Brésil	https://futurejournal.org/FSR/article/view/	Innovation Management	Google Scholar
13	杨双业, 张鹏飞, 王飞, 罗嘉, 李庆福, 杨斌, 梁卫斌	新型自动化技术在钻机及钻井中的应用展望	2019	China Petroleum Machinery	html.rhhz.net	Article	Chine	http://html.rhhz.net/syjxzz/html/20190502	Energie / GeoSciences	Google Scholar
14	Y Zhifeng, H Fei, F Xuehui, Y Qi, C Zhen, Z Yidan	Cloud Computing and Big Data for Oil and Gas Industry Application, China	2019	Journal of Computers	http://www.jcomputers.us/vol14/jcp1404-04.pdf	Article	Chine	http://www.jcomputers.us/vol14/jcp1404-0	Data Sciences	Google Scholar
15	Prawira, A.	Logging while drilling operation	2019	Engineering Solid Mechanics	Growing Science	Article	Canada	http://dx.doi.org/10.5267/j.esm.2019.6.001	Engineering Management	Autres
16	Amaechi, UC ; Ikpeka, PM ; Ma, XL ; Ugwu, JO	Application of machine learning models in predicting initial gas production rate from tight gas reservoirs	2019	The Mining-Geology-Petroleum Engineering Bulletin	RUDARSKO-GEOLOSKO-NAFTNI ZBORNIK	Article	Croatie	https://doi.org/10.17794/rgn.2019.3.4	Energie / GeoSciences	WoS, SCOPUS
17	Sung-Woo Park, Myung-Il RohMyung-Il Roh, Min-jae Oh, Min-	Association Analysis of Piping Materials of an Offshore Structure Using Big Data Technology	2019	JOURNAL OF SHIP PRODUCTION AND DESIGN	Society of Naval Architects and Marine Engineers	Article	USA	https://doi.org/10.5957/JSPD.170058	Engineering Management	WoS, SCOPUS
18	Ren, S., Zhao, X., Huang, B., Wang, Z., Song, X.	A framework for shopfloor material delivery based on real-time manufacturing big data	2019	Journal of Ambient Intelligence and Humanized Computing	Springer Verlag	Article	Germany		Data Sciences	WoS, SCOPUS
19	D A Zakoldaev, A V Shukalov, I O Zharinov, O O Zharinov	Structure of digital and smart factories of the Industry 4.0	2019	IOP Conf. Series: Materials Science and Engineering	IOP Publishing	Conference Paper	Russie	doi:10.1088/1757-899X/560/1/012208	Engineering Management	WoS
20	J Lu, ZH Liu, P Xu, C Zhang	UDBMS: road to unification for multi-model data management	2018	International Conference on Conceptual Modeling / Lecture Notes ir	Springer	Conference Paper	Chine	https://link.springer.com/chapter/10.1007/	Data Sciences	Google Scholar
21	H Hassani, ES Silva	Big Data: a big opportunity for the petroleum and petrochemical industry	2018	OPEC Energy Review	Wiley Online Library	Article	Austria	https://onlinelibrary.wiley.com/doi/abs/10.	Energie / GeoSciences	Google Scholar
22	D Agrawal, S Chawla, B Contreras-Rojas, …	RHEEM: enabling cross-platform data processing: may the big data be with you!	2018	Proceedings of the VLDB Endowment	dl.acm.org	Conference Paper	USA	https://dl.acm.org/citation.cfm?id=3269455	Data Sciences	Google Scholar
23	CY Lee, HY Chong, X Wang	Streamlining digital modeling and building information modelling (BIM) uses for the oil and gas projects	2018	Archives of Computational Methods in Engineering	Springer	Article	Netherlands	https://link.springer.com/article/10.1007/s	Engineering Management	Google Scholar
24	Z Kaoudi, JA Quiane-Ruiz	Cross-Platform Data Processing: Use Cases and Challenges	2018	2018 IEEE 34th International Conference on Data Engineering (ICDE)	ieeexplore.ieee.org	Conference Paper	France	https://ieeexplore.ieee.org/abstract/docum	Data Sciences	Google Scholar
25	P Joshi, R Thapliyal, AA Chittambakkam, …	Big Data Analytics for Micro-Seismic Monitoring	2018	Offshore Technology Conference Asia	onepetro.org	Conference Paper	Malaysia	https://www.onepetro.org/conference-pap	Energie / GeoSciences	Google Scholar
26	MJ Clifford, RK Perrons, SH Ali, TA Grice	Extracting innovations: mining, energy, and technological change in the digital age	2018	CRC Press	taylorfrancis.com	Book Chapter	USA	https://www.taylorfrancis.com/books/9781	Energie / GeoSciences	Google Scholar
27	TMAM Taha	Competitive Analysis of the Global Oil and Gas Industry using Porters Five Forces Model	2018	The 7th Annual Conference of Economic Forum of Entrepreneurship	researchgate.net	Conference Paper	United Kingdom	https://www.researchgate.net/profile/Tarig	Sciences de Gestion	Google Scholar
28	SM Khandaker, A Hussain, M Ahmed	Effectiveness of Hard Clustering Algorithms for Securing Cyber Space	2018	International Conference on Smart Grid and Internet of Things / Lect	Springer	Conference Paper	Slovakia	https://link.springer.com/chapter/10.1007/	Data Sciences	Google Scholar
29	MXIN SONG	Research on the Application of Big Data in Oil & Gas Industry	2018	DEStech Transactions on COMPUTER SCIENCE and ENGINEERING / ZC	dpi-proceedings.com	Conference Paper	Chine	http://www.dpi-proceedings.com/index.ph	Energie / GeoSciences	Google Scholar
30	Q Huang, AAB Sadok, MA Baslaib	Recoverable Oil Mapping and Infill Drilling Optimization for Mixed-Wet Carbonate Reservoirs	2018	Abu Dhabi International Petroleum Exhibition & Conference	onepetro.org	Conference Paper	UAE	https://www.onepetro.org/conference-pap	Energie / GeoSciences	Google Scholar
31	B Djamaluddin, S Mohammed	Survey of Big Data New SQL Database Systems for Real-Time Data Transfer in the Upstream Oil and Gas Industry	2018	SPE Kingdom of Saudi Arabia Annual Technical Symposium and Exhib	onepetro.org	Conference Paper	KSA	https://www.onepetro.org/conference-pap	Energie / GeoSciences	Google Scholar
32	S Chawla, B Contreras-Rojas, Z Kaoudi, …	Building your Cross-Platform Application with RHEEM	2018	Qatar Computing Research Institute QCRI	arxiv.org	Working paper	Qatar	https://arxiv.org/abs/1805.11723	Data Sciences	Google Scholar
33	NT Lawal, OA Odeniyi, BO Makinde, JA Adewale, …	An Investigative Study Of Big Data Technology Application And Its Impact In The Upstream Operations Of An Oil And Gas Industry In Nigeria	2018	International Journal of Innovative Research and Advanced Studies (I	ijiras.com	Article	India	http://www.ijiras.com/2018/Vol_5-Issue_6/	Innovation Management	Google Scholar
34	FDAS ALANO, DAK SILVA, SA FURLAN	GESTÃO CIENTÍFICA DE UMA INSTITUIÇÃO DE ENSINO SUPERIOR: MÉTODO DE IDENTIFICAÇÃO DAS ÁREAS ESTRATÉGICAS DE PESQUISA	2018	singep.org.br	Anais do VII SINGEP	Conference Paper	Brésil	http://www.singep.org.br/7singep/resultad	Innovation Management	Google Scholar
35	NI Goldena	A Proposal for Duplicate Data Detection in Big Data	2018	International Journal for Research in Applied Science and Engine	INTERNATIONAL JOURNAL OF SCIENTIFIC AND RESEARCH PI	Article	Inde	http://ijaset.com/fileserve.php?FID=14556	Data Sciences	ResearchGate
36	A. Leeri, M Alkandari	Real-time warehouse architecture proposal for oil and gas industry	2018	Journal of Theoretical and Applied Information Technology	JATIT.ORG	Article	Pakistan	http://www.jatit.org/volumes/Vol96No16/2	Systèmes d'Information	Autres
37	Opeyemi Bello, Tanveer Yaqoob, Helen Udo, Marc Spinneker	Drilling Systems Design and Operational Management: Leveraging the Value of Advanced Data-Driven Analytics	2018	Oil Gas European Magazine	Urban-Verlag	Article	Germany		Energie / GeoSciences	WoS
38	Sanja Lazarova-Molnar ; Nader Mohamed ; Jameela Al-Jaroodi	Collaborative Data Analytics for Industry 4.0: Challenges, Opportunities and Models	2018	2018 Sixth International Conference on Enterprise Systems (ES)	ieeexplore.ieee.org	Conference Paper	Cyprus	https://doi.org/10.1109/ES.2018.00023	Sciences de Gestion	WoS
39	Tiwari Sunil; Wee H. M.; Daryanto Yosef	Big data analytics in supply chain management between 2010 and 2016: Insights to industries	2018	COMPUTERS & INDUSTRIAL ENGINEERING	Elsevier	Article	United Kingdom	https://doi.org/10.1016/j.cie.2017.11.017	Systèmes d'Information	WoS, SCOPUS
40	Elaine Masa, Peter Busch, Gustavo Guzman, Louis Sanzogni	Qualitative Analysis of Big Data Analytics in the Oil & Gas Industry	2018	International Business Information Management Association Confere	IBIMA 2018 Innovation Management and Education Excelle	Conference Paper	Italy	https://ibima.org/accepted-paper/a-qualita	Innovation Management	WoS
41	RM Alguliyev, RT Gasimova, …	The obstacles in Big data process	2017	International Journal of Modern Education and Computer Science (IJ	researchgate.net	Article	Chine	https://www.researchgate.net/profile/Rena	Data Sciences	Google Scholar
42	RM Alguliyev, YN Imamverdiyev	Conceptual big data architecture for the oil and gas industry	2017	Problems of information technology	www.jpit.az	Article	Azerbaijan	https://www.researchgate.net/profile/Rami	Systèmes d'Information	Google Scholar
43	A AlNouss, MK Kazi, F Mohammed, …	Integrated Data (i-Data), Mining and Utilization Approach for Effective Flare Management Strategies	2017	Industrial & Engineering Chemistry Research (Q1)	ACS Publications	Article	USA	https://pubs.acs.org/doi/abs/10.1021/acs.ie	Engineering Management	Google Scholar
44	Y Rizk, H Partamian, M Awad	Toward real-time seismic feature analysis for bright spot detection: a distributed approach	2017	IEEE Journal of Selected Topics in Applied Earth Observations and Re	ieeexplore.ieee.org	Article	USA	https://ieeexplore.ieee.org/abstract/docum	Energie / GeoSciences	Google Scholar
45	RM Alguliyev, YN Imamverdiyev	Big data strategy for the oil and gas industry: General directions	2017	Problems of information technology	www.jpit.az	Article	Azerbaijan	https://jpit.az/index.php?mod=journals&id=	Systèmes d'Information	Google Scholar
46	A Gezdur, J Bhattacharjya	Digitization in the Oil and Gas Industry: Challenges and Opportunities for Supply Chain Partners	2017	Working Conference on Virtual Enterprises	Springer	Conference Paper	Austria	https://link.springer.com/chapter/10.1007/	Sciences de Gestion	Google Scholar
47	J Kemper	Uncertain Estimates in Cross-Platform Plan Optimization	2017	Hasso-Plattner-Institute. Universität de Potsdam		These / mémoire	Germany	https://drive.google.com/file/d/1a856EfCVI	Systèmes d'Information	Google Scholar
48	МС Чесановський, ВІ Шекета	Implementation of the integrated information solutions concepts for large scale data in oil and gas engineering	2017	SCIENTIFIC BULLETIN IVANO-FRANKIVSK NATIONAL TECHNICAL UNIV	nv.nung.edu.ua	These / mémoire	Ukraine	http://nv.nung.edu.ua/index.php/nv/article	Energie / GeoSciences	Google Scholar
49	B Agayev, S Agayeva	INFORMATION PRODUCTION AND DEVELOPMENT OF SOCIETY: CAUSAL RELATIONSHIPS	2017	Problems of information society	article.jpis.az	Article	Azerbaijan	http://article.jpis.az/id/eprint/41	Systèmes d'Information	Google Scholar
50	МС Чесановський, ВІ Шекета	Імплементація концепцій інтегрованих інформаційних рішень для великих даних у нафтогазовій справі	2017	SCIENTIFIC BULLETIN IVANO-FRANKIVSK NATIONAL TECHNICAL UNIV	nv.nung.edu.ua	Article	Ukraine	http://194.44.112.14/handle/123456789/65	Energie / GeoSciences	Google Scholar
51	МС Чесановський, ВІ Шекета	Управління інтеграцією великих даних для оперативного прийняття рішень в нафтогазовій справі	2017	SCIENTIFIC BULLETIN IVANO-FRANKIVSK NATIONAL TECHNICAL UNIV	nv.nung.edu.ua	Article	Ukraine	http://194.44.112.14/handle/123456789/67	Energie / GeoSciences	Google Scholar
52	HN Jahromi, AM. Jorge	An Overview of Data Mining Applications in Oil and Gas Exploration: Structural Geology and Reservoir Property-Issues	2017	DM4OG'2017 Workshop on Data Mining for Oil and Gas	DM4OG 2017 proceedings	Conference Paper	USA, Portugal	https://arxiv.org/abs/1705.06345	Energie / GeoSciences	ResearchGate
53	A Bozkurt	Türkiye'de uzaktan eğitimin dünü, bugünü ve yarını	2017	Açıköğretim Uygulamaları ve Araştırmaları Dergisi AUAd	auad.anadolu.edu.tr	Article	Turquie	https://dergipark.org.tr/en/download/articl	Sciences de l'Education	ResearchGate
54	Surabhi Verma	Big Data and Advance Analytics: Architecture, Techniques, Applications, and Challenges	2017	International Journal of Business Analytics (IJBAN)	IGI Global	Article	USA	http://dx.doi.org/10.4018/IJBAN.2017100101	Sciences de Gestion	WoS
55	Dule C.S., Girijamma H.A.	Guaging the Effectivity of Existing Security Measures for Big Data in Cloud Environment	2017	Software Engineering Trends and Techniques in Intelligent Systems. (	Springer	Book Chapter	Czech	https://doi.org/10.1007/978-3-319-57141-6	Data Sciences	WoS, SCOPUS
56	D Agrawal, S Chawla, AK Elmagarmid, Z Kaoudi, …	Road to Freedom in Big Data Analytics.	2016	EDBT	da.qcri.org	Conference Paper	Qatar	http://da.qcri.org/ntang/pubs/[edbt2016]rt	Data Sciences	Google Scholar
57	D Agrawal, L Ba, L Berti-Equille, S Chawla, …	Rheem: Enabling multi-platform task execution	2016	Proceedings of the 2016 International Conference on Management o	dl.acm.org	Conference Paper	USA	https://dl.acm.org/citation.cfm?id=2899414	Data Sciences	Google Scholar
58	M Shah	Big data and the internet of things	2016	Big data analysis: New algorithms for a new society	Springer	Book Chapter	Suisse	https://link.springer.com/chapter/10.1007/	Data Sciences	Google Scholar
59	M Mazieri, E Soares	Conceptualization and theorization of the Big Data	2016	International Journal of Innovation (IJI …	papers.ssrn.com	Article	Brésil	https://papers.ssrn.com/sol3/papers.cfm?a	Innovation Management	Google Scholar
60	H Hamzeh	Application of Big Data in Petroleum Industry	2016	Department of Electronics and Computer Engineering. Istanbul Şehir	academia.edu	Working paper	Turquie	http://www.academia.edu/download/4742(	Data Sciences	Google Scholar
61	J Sarraipa, K Seferis, V Prieto, G Cleere, …	Aquaculture Production Optimization through Enhanced Data Analytics	2016	The International Offshore Mariculture Conference / 6th Offshore Mi	AQUASMART Consortium / H2020-644715 AQUASMART Pro	Conference Paper	Espagne	H2020-644715 AQUASMART	Aquaculture / Mariculture	Google Scholar
62	Y Imamverdiyev	Big prospects and problems of Big Data technology	2016	Problems of information society	article.jpis.az	Article	Azerbaijan	http://article.jpis.az/39/	Systèmes d'Information	Google Scholar
63	A Bozkurt	Öğrenme analitiği: e-öğrenme, büyük veri ve bireyselleştirilmiş öğrenme	2016	Açıköğretim Uygulamaları ve Araştırmaları Dergisi	dergipark.org.tr	Article	Turquie	https://dergipark.org.tr/auad/issue/34066/	Sciences de l'Education	Google Scholar
64	РМ Алыгулиев, ИЯ Алекперова	Проблема BIG DATA в нефтегазовой отрасли: состояние и перспективы	2016	Информационные технологии	https://elibrary.ruhttps://elibrary.ru/title_about.asp?id=87	Article	Russie	https://elibrary.ru/item.asp?id=27349226	Systèmes d'Information	Google Scholar
65	BS Aghayev, TS Aliyev	PROBLEMS OF THE APPLICATION OF VIDEO ANALYTICS IN SURVEILLANCE SYSTEMS	2016	Problems of information technology	jpit.az	Article	Azerbaijan	https://jpit.az/uploads/article/en/PROBLEM	Systèmes d'Information	Google Scholar
66	和田良太, 高木健 / R Wada, K Takagi	我が国の海洋開発力強化と協創プラットフォームについて Co-creation Platform for Enhancement of Japanese Offshore Technology	2016	日本船舶海洋工学会論文集Journal of the Japan Society of Naval Ar	jstage.jst.go.jp	Article	Japan	https://www.jstage.jst.go.jp/article/jjasnaoe	Engineering Management	Google Scholar
67	RM Alguliyev, YN Imamverdiyev, FJ Abdullayeva	THE INVESTIGATION OF OPPORTUNITIES OF BIG DATA ANALYTICS AS ANALYTICS-AS-A-SERVICE IN CLOUD COMPUTING FOR OIL AND GAS …	2016	Journal of Systems and Information Technology	jpit.az	Article	Azerbaijan	https://jpit.az/en/journals/152	Systèmes d'Information	Google Scholar
68	D Agrawal, SCAEZ Kaoudi, M Ouzzani, …	RHEEM: Road to Freedom in Big Data Analytics	2016	19th International Conference on Extending Database Technology, Pr	Elsevier	Conference Paper	France	https://asu.pure.elsevier.com/en/publicatic	Data Sciences	Google Scholar
69	M Gupta, G Gupta, I S Gupta	Reflection Seismic data analysis using Big Data	2016	Advances in Computer Science and Information Technology	© Krishi Sanskriti Publications	Article	Inde	https://www.krishisanskriti.org/vol_image/t	Systèmes d'Information	ResearchGate
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71	T Aliev, B S Aghayev	Videoanalitikanın teleqörmə mühafizə sistemlərinə tətbiqi problemləri haqqında	2016	Informasiya Texnologiyaları Problemləri	JPIT.AZ	Article	Azerbaijan	10.25045/jpit.v07.i2.05	Systèmes d'Information	ResearchGate
72	ABUBAKAR, K, JUDE, J., YUSUFF, A.S., & EMMANUEL, O.G	Innovating with Data: the Aquila Technology Case in Petroleum Equalization Fund (Management) Board	2016	4TH TH Big Data Analytics and Innovation Conference	2016 KIE Publications: Proceedings on Big Data Analytics &	Conference Paper	Nigeria, Grande Bretagne	ISBN 9781859242223	Innovation Management	Autres
73	Ray Y.Zhong, Stephen T.Newman, George Q.Huang, Shulin Lan	Big Data for supply chain management in the service and manufacturing sectors: Challenges, opportunities, and future perspectives	2016	COMPUTERS & INDUSTRIAL ENGINEERING	Elsevier	Article	United Kingdom	https://doi.org/10.1016/j.cie.2016.07.013	Engineering Management	WoS, SCOPUS
74	M Graczyk-Kucharska	Big Data konieczności współczesnego marketingu	2015	ZESZYTY NAUKOWE UNIWERSYTETU SZCZECIŃSKIEGO	https://wnus.edu.pl/miz/pl/issue/50/article/776/	Article	Pologne	https://www.ceeol.com/search/article-deta	Sciences de Gestion	Google Scholar
75	A Baaziz	Synergie du triptyque: Knowledge Management, Intelligence Economique et Business Intelligence. Contribution à la réduction des risques liés aux décisions …	2015	Université Aix-marseille	theses.fr	These / mémoire	France	https://www.theses.fr/2015AIXM5900	Sciences de l'Information	Google Scholar
76	JM Cha, J Shin, CS Yeom	A Review on Applicability of Big Data Technology in Nuclear Power Plant: Focused on O&M Phases	2015	Conference: Transactions of the Korean Nuclear Society Spring Meeti	researchgate.net	Conference Paper	Korea	https://www.researchgate.net/profile/Jae I	Energie / GeoSciences	Google Scholar
77	JM Cha, J Shin, CY Son, DS Hwang, …	A Study on the Application of SE Approach to the Design of Health Monitoring Pilot Platform utilizing Big Data in the Nuclear Power Plant (NPP)	2015	Journal of the Korea Society of Systems Engineering (시스템엔지니어	koreascience.or.kr	Article	Korea	http://www.koreascience.or.kr/article/Artic	Engineering Management	Google Scholar
78	JM Cha, C Yeom	플랜트 산업에서의 빅데이터 현황 분석 Current Status of Big Data in Plant Industry	2015	한국 CDE 학회 학술발표회 논문집 Summer Conference of Society o	http://www.dbpia.co.kr/journal/articleDetail?nodeId=NOD(	Conference Paper	Korea	https://www.researchgate.net/profile/Jae I	Engineering Management	Google Scholar
79	王宏琳, 马涛	新兴信息技术综述 (一)	2015	石油工业计算机应用	cqvip.com	Article	Chine	http://www.cqvip.com/qk/98190x/201502/	Energie / GeoSciences	Google Scholar
80	G Rincon Vergara, CHRISTIAN DONALDO, Hernandez Duran	Desempeño Computacional Del Algoritmo De Decodificacion Huffman En Un Gpu.	2015	Universidad Industrial de Santander. Facultad de Ingenierías Fisicom	noesis.uis.edu.co	These / mémoire	Colombie	http://noesis.uis.edu.co/bitstream/1234567	Energie / GeoSciences	Google Scholar
81	V Mayer-Schönberger, K Cukier	BIG DATA KONIECZNOŚCIĄ WSPÓŁCZESNEGO MARKETINGU	2015	bazhum.muzhp.pl		Article	Pologne	http://bazhum.muzhp.pl/media/files/Probl	Sciences de Gestion	Google Scholar
82	차재민, 손준영, 황동식, 신중욱, 염충섭	원전 상태 감시 및 조기 경보용 빅데이터 시범 플랫폼의설계를 위한 시스템 엔지니어링 방법론 적용 연구	2015	pdfs.semanticscholar.org		Article	Korea	https://pdfs.semanticscholar.org/7eba/a01:	Engineering Management	Google Scholar
83	JM Cha, J Shin, CS Yeom	A Review on Applicability of Big Data Technology in Nuclear Power Plant: Focused on O&M Phases	2015	Transactions of the Korean Nuclear Society Spring Meeting	International Nuclear Information System (INIS) / The Interi	Conference Paper	Korea	https://inis.iaea.org/search/searchsinglerec	Energie / GeoSciences	ResearchGate
84	R Alguliyev, Y Imamverdiyev	Big data: big promises for information security	2014	2014 IEEE 8th International Conference on Application of Information	ieeexplore.ieee.org	Conference Paper	Kazakhstan	https://ieeexplore.ieee.org/abstract/docum	Data Sciences	Google Scholar
85	L Zhang	A framework to specify big data driven complex cyber physical control systems	2014	2014 IEEE International Conference on Information and Automation (	ieeexplore.ieee.org	Conference Paper	China	https://ieeexplore.ieee.org/abstract/docum	Data Sciences	Google Scholar
86	S Suneetha, M Usha Rani	Swift towards Big Data Analytics	2014	International Journal of Engineering Research & Technology	NCDMA 2014 Conferences Proceeding	Article	Inde	https://www.ijert.org/swift-towards-big-dat	Engineering Management	Autres
87	C Jess	Financial benefits of technological innovation in the oil and gas industry		15writers.com	15writers.com	Blog	United Kingdom	https://15writers.com/sample-essays/finan	Sciences de Gestion	Google Scholar

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6. **Structure of digital and smart factories of the Industry 4.0**
By: Zakoldaev, D. A.; Shukalov, A. V.; Zharinov, I. O.; et al.
Conference: 13th International Conference on Mechanical Engineering, Automation and Control Systems (MEACS) Location: Novosibirsk State Univ, Novosibirsk, RUSSIA Date: DEC 12-14, 2018
INTERNATIONAL CONFERENCE ON MECHANICAL ENGINEERING, AUTOMATION AND CONTROL SYSTEMS 2018 Book Series: IOP Conference Series-Materials Science and Engineering Volume: 560 Article Number: UNSP 012208 Published: 2019
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7. **Application of machine learning models in predicting initial gas production rate from tight gas reservoirs**
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RUDARSKO-GEOLOSKO-NAFTNI ZBORNIK Volume: 34 Issue: 3 Pages: 29-40 Published: 2019
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8. **RHEEM: Enabling Cross-Platform Data Processing**
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9. **Streamlining Digital Modeling and Building Information Modelling (BIM) Uses for the Oil and Gas Projects**
By: Lee, Cen-Ying; Chong, Heap-Yih; Wang, Xiangyu
ARCHIVES OF COMPUTATIONAL METHODS IN ENGINEERING Volume: 25 Issue: 2 Pages: 349-396 Published: APR 2018
Texte intégral AMU ? | Full Text from Publisher | View Abstract
Times Cited: 2 *(from All Databases)*
Usage Count

10. **Big Data: a big opportunity for the petroleum and petrochemical industry**

By: Hassani, Hossein; Silva, Emmanuel Sirimal
OPEC ENERGY REVIEW Volume: 42 Issue: 1 Pages: 74-89 Published: MAR 2018

Texte intégral AMU ? | Full Text from Publisher | Free Accepted Article From Repository

View Abstract

Times Cited: 3 *(from All Databases)*

Usage Count

11. **Drilling Systems Design and Operational Management: Leveraging the Value of Advanced Data-Driven Analytics**

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OIL GAS-EUROPEAN MAGAZINE Volume: 44 Issue: 1 Pages: OG32-OG34 Published: MAR 2018

Texte intégral AMU ? | Full Text from Publisher | View Abstract

Times Cited: 0 *(from All Databases)*

Usage Count

12. **Cross-Platform Data Processing: Use Cases and Challenges**

By: Kaoudi, Zoi; Quiane-Ruiz, Jorge-Arnulfo
Conference: 34th IEEE International Conference on Data Engineering Workshops (ICDEW) Location: Paris, FRANCE Date: APR 16-19, 2018
Sponsor(s): IEEE; IEEE Comp Soc; U S Natl Sci Fdn
2018 IEEE 34TH INTERNATIONAL CONFERENCE ON DATA ENGINEERING (ICDE) Book Series: IEEE International Conference on Data Engineering Pages: 1723-1726 Published: 2018

Texte intégral AMU ? | Full Text from Publisher | View Abstract

Times Cited: 0 *(from All Databases)*

Usage Count

13. **Collaborative Data Analytics for Industry 4.0: Challenges, Opportunities and Models**

By: Lazarova-Molnar, Sanja; Mohamed, Nader; Al-Jaroodi, Jameela
Conference: 6th International Conference on Enterprise Systems (ES) Location: Limassol, CYPRUS Date: OCT 01-02, 2018
Sponsor(s): IEEE Comp Soc; Cyprus Tourist Org; Austrian Airlines
2018 SIXTH INTERNATIONAL CONFERENCE ON ENTERPRISE SYSTEMS (ES 2018) Book Series: International Conference on Enterprise Systems (ES) Pages: 100-107 Published: 2018

Texte intégral AMU ? | Full Text from Publisher | View Abstract

Times Cited: 1 *(from All Databases)*

Usage Count

14. **Big data analytics in supply chain management between 2010 and 2016: Insights to industries**

By: Tiwari, Sunil; Wee, H. M.; Daryanto, Yosef
COMPUTERS & INDUSTRIAL ENGINEERING Volume: 115 Pages: 319-330 Published: JAN 2018

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15. **Qualitative Analysis of Big Data Analytics in the Oil & Gas Industry**

By: Masa, Elaine; Busch, Peter; Guzman, Gustavo; et al.
Conference: 31st International-Business-Information-Management-Association Conference Location: Milan, ITALY Date: APR 25-26, 2018
Sponsor(s): Int Business Informat Management Assoc
INNOVATION MANAGEMENT AND EDUCATION EXCELLENCE THROUGH VISION 2020, VOLS I - XI Pages: 287-306 Published: 2018

Texte intégral AMU ? | View Abstract

Times Cited: 0 *(from All Databases)*

Usage Count

16. **Toward Real-Time Seismic Feature Analysis for Bright Spot Detection: A Distributed Approach**

By: Rizk, Yara; Partamian, Hmayag; Awad, Mariette
IEEE JOURNAL OF SELECTED TOPICS IN APPLIED EARTH OBSERVATIONS AND REMOTE SENSING Volume: 11 Issue: 1 Pages: 322-331 Published: JAN 2018

Texte intégral AMU ? | Full Text from Publisher | View Abstract

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Usage Count

17. **Big Data and Advance Analytics: Architecture, Techniques, Applications, and Challenges**

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INTERNATIONAL JOURNAL OF BUSINESS ANALYTICS Volume: 4 Issue: 4 Pages: 21-47 Published: OCT-DEC 2017

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18. **Integrated Data (i-Data), Mining and Utilization Approach for Effective Flare Management Strategies**

By: AlNouss, Ahmed; Kazi, Monzure-Khoda; Mohammed, Fand; et al.
INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH Volume: 56 Issue: 10 Pages: 2789-2803 Published: MAR 15 2017

Texte intégral AMU ? | Full Text from Publisher | View Abstract

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19. **Guaging the Effectivity of Existing Security Measures for Big Data in Cloud Environment**

By: Dule, Chhaya S.; Girijamma, H. A.
Conference: 6th Computer Science On-Line Conference (CSOC) Location: Zlin, CZECH REPUBLIC Date: APR, 2017
Sponsor(s): OpenPublish eu s r o
SOFTWARE ENGINEERING TRENDS AND TECHNIQUES IN INTELLIGENT SYSTEMS, CSOC2017, VOL 3 Book Series: Advances in Intelligent Systems and Computing Volume: 575 Pages: 209-219 Published: 2017

Times Cited: 0 *(from All Databases)*

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20. **Big Data for supply chain management in the service and manufacturing sectors: Challenges, opportunities, and future perspectives**

By: Zhong, Ray Y.; Newman, Stephen T.; Huang, George Q.; et al.
COMPUTERS & INDUSTRIAL ENGINEERING Volume: 101 Pages: 572-591 Published: NOV 2016

Texte intégral AMU ? | Full Text from Publisher | View Abstract

Times Cited: 109 *(from All Databases)*

Highly Cited Paper

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21. **CONCEPTUALIZATION AND THEORIZATION OF THE BIG DATA**

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INTERNATIONAL JOURNAL OF INNOVATION Volume: 4 Issue: 2 Pages: 23-41 Published: JUL-DEC 2016

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22. **Проблема BIG DATA в нефтегазовой отрасли: состояние и перспективы**

Big DATA Problem in Oil and Gas Industry: Current State and Prospects

By: Алыгулиев, Р.М.; Алекперова, И.Я.
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Информационные технологии Volume: 22 Issue: 11 Pages: 862-869 Published: 2016
Informatsionnye tekhnologii Volume: 22 Issue: 11 Pages: 862-869 Published: 2016

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Times Cited: 0 *(from All Databases)*

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23. **Rheem: Enabling Multi-Platform Task Execution**

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Conference: ACM SIGMOD International Conference on Management of Data Location: San Francisco, CA Date: JUN 26-JUL 01, 2016
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SIGMOD'16: PROCEEDINGS OF THE 2016 INTERNATIONAL CONFERENCE ON MANAGEMENT OF DATA Pages: 2069-2072 Published: 2016

Texte intégral AMU ? | Full Text from Publisher | View Abstract

Times Cited: 9 *(from All Databases)*

Usage Count

24. **A Framework to Specify Big Data Driven Complex Cyber Physical Control Systems**

By: Zhang, Lichen
Conference: IEEE International Conference on Information and Automation (ICIA) Location: Hailar, PEOPLES R CHINA Date: JUL 28-30, 2014
Sponsor(s): IEEE
2014 IEEE INTERNATIONAL CONFERENCE ON INFORMATION AND AUTOMATION (ICIA) Pages: 548-553 Published: 2014

Texte intégral AMU ? | Full Text from Publisher | View Abstract

Times Cited: 8 *(from All Databases)*

Usage Count

25. **Big Data: Big Promises for Information Security**

By: Alguliyev, Rasim; Imamverdiyev, Yadigar
Conference: 8th IEEE International Conference on Application of Information and Communication Technologies (AICT) Location: Astana, KAZAKHSTAN Date: OCT 15-17, 2014
Sponsor(s): Inst Elect & Elect Engineers; Thomson Reuters; MIKRO Informat Handling & Distribut FZE; EMC2; Chevron Corp; Assoc IT Co Kazakhstan; TAMUR; Faktor; Doctor Web; QAFQAZ UNIV; NAZARBAYEV UNIV RES & INNOVAT SYST; Gumilyov Eurasian Natl Univ, IS&C Inst; IEEE Comp Soc, Azerbaijan Chapter; Lomonosov Moscow State Univ
2014 IEEE 8TH INTERNATIONAL CONFERENCE ON APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES (AICT) Book Series: International Conference on Application of Information and Communication Technologies Pages: 216-219 Published: 2014

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HOW TO USE BIG DATA TECHNOLOGIES TO OPTIMIZE OPERATIONS IN UPSTREAM PETROLEUM INDUSTRY

By: Baaziz, A (Baaziz, Abdelkader)[1] ; Quoniam, L (Quoniam, Luc)[1]
View ResearcherID and ORCID

INTERNATIONAL JOURNAL OF INNOVATION
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Abstract

"Big Data is the oil of the new economy" is the most famous citation during the three last years. It has even been adopted by the World Economic Forum in 2011. In fact, Big Data is like crude! It's valuable, but if unrefined it cannot be used. It must be broken down, analyzed for it to have value.

But what about Big Data generated by the Petroleum Industry and particularly its upstream segment?

Upstream is no stranger to Big Data. Understanding and leveraging data in the upstream segment enables firms to remain competitive throughout planning, exploration, delineation, and field development.

Oil & Gas Companies conduct advanced geophysics modeling and simulation to support operations where 2D, 3D & 4D Seismic generate significant data during exploration phases. They closely monitor the performance of their operational assets. To do this, they use tens of thousands of data-collecting sensors in subsurface wells and surface facilities to provide continuous and real-time monitoring of assets and environmental conditions. Unfortunately, this information comes in various and increasingly complex forms, making it a challenge to collect, interpret, and leverage the disparate data. As an example, Chevron's internal IT traffic alone exceeds 1.5 terabytes a day.

Big Data technologies integrate common and disparate data sets to deliver the right information at the appropriate time to the correct decision-maker. These capabilities help firms act on large volumes of data, transforming decision-making from reactive to proactive and optimizing all phases of exploration, development and production. Furthermore, Big Data offers multiple opportunities to ensure safer, more responsible operations. Another invaluable effect of that would be shared learning.

The aim of this paper is to explain how to use Big Data technologies to optimize operations. How can Big Data help experts to decision-making leading the desired outcomes?

Keywords

Author Keywords: Big Data; Analytics; Upstream Petroleum Industry; Knowledge Management; KM; Business Intelligence; BI; Innovation; Decision-making under Uncertainty

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