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MASTER EN INGÉNIEUR DE GESTION À FINALITÉ SPÉCIALISÉE EN DATA SCIENCE

Comment définir des indicateurs clés de performance pour la mesure de l'agilité d'une entreprise ?

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Award date:
2023

Awarding institution:
Universite de Namur

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Comment définir des indicateurs clés de performance pour la mesure de l'agilité d'une entreprise ?

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Mémoire présenté en vue de l'obtention du titre de

Master 120 - Ingénieur de Gestion Finalité Spécialisée

ANNÉE ACADÉMIQUE : 2022-2023

Remerciements

Tout d'abord, je tiens à remercier chaleureusement mon promoteur, le Professeur Simonofski pour son implication et son accompagnement dans le cadre de ce mémoire.
Ensuite, je tiens à remercier mes amis pour leur soutien dans l'élaboration de ce mémoire mais également durant tout mon cursus universitaire.
J'adresse également mon entière reconnaissance à ma famille et, en particulier, à mes parents pour leur aide continue durant mes années d'études.
Enfin, j'aimerais remercier l'ensemble des professeurs et assistants de la faculté des Sciences Économiques, Sociales et de Gestion, pour l'enseignement de qualité et la disponibilité dont ils ont fait preuve tout au long de mon cursus.

Résumé / Summary

Résumé

L'importance croissante de l'agilité d'entreprise en tant que solution face à un environnement instable a été reconnue depuis plusieurs années. Cependant, l'évaluation de cette agilité demeure complexe en raison de sa nature multidimensionnelle. Plusieurs approches divergentes existent et un consensus fait défaut entre elles. La problématique de recherche vise à identifier les indicateurs clés de performance (KPI) permettant de mesurer l'agilité et à quantifier ces indicateurs en se basant sur la littérature scientifique relative à la mesure de l'agilité en entreprise. Notre méthodologie repose sur l'hypothèse selon laquelle plus un KPI est important dans la littérature scientifique, plus il est significatif. Afin de sélectionner les KPIs à retenir ainsi que leur pondération, nous avons recours à diverses méthodes : occurrence, fréquence et TF-IDF. Nos conclusions rejoignent celles de la littérature existante. Nous élaborons un questionnaire destiné à évaluer chaque KPI identifié. Ce questionnaire sera ensuite administré à une entreprise pilote. Les résultats obtenus au moyen de notre approche semblent cohérents avec la vision de l'agilité telle qu'elle est perçue par l'un des cadres de l'entreprise. En conclusion, nous achevons ce mémoire en identifiant quelques pistes d'amélioration de notre méthode, tout en soulignant les points forts de notre démarche.

Summary

The growing significance of enterprise agility as a remedy for an unstable environment has been acknowledged for several years. However, evaluating this agility remains intricate due to its multidimensional nature. Various disparate approaches exist and a consensus is lacking among them. The research question aims to identify key performance indicators (KPIs) that facilitate the measurement of agility and to quantify these indicators based on scientific literature addressing the measurement of enterprise agility. Our methodology operates under the assumption that the more extensively a KPI is discussed in scientific literature, the more meaningful it becomes. To select the KPIs to retain along with their weightings, we use multiple methods: occurrence, frequency and TF-IDF. Our conclusions align with those found in existing literature. We construct a questionnaire designed to evaluate each identified KPI. This questionnaire will subsequently be administered to a pilot company. The results obtained through our approach appear consistent with the perception of agility as held by one of the company's executives. In conclusion, we conclude this dissertation by identifying some ways to improve our method, while highlighting the strengths of our approach.

Table des matières

1. Introduction 6
1.1. Contexte 6
1.2. Le défi de la mesure de l'agilité d'entreprise 7
1.3. Objectif du mémoire 8
1.4. Cheminement suivi 8
1.5. Contribution à la littérature scientifique 9
1.6. Structuration du mémoire 9
2. Revue de la littérature 10
2.1. Préambule 10
2.2. Les définitions de l'agilité d'entreprise 10
2.3. Les cinq dimensions de l'agilité d'entreprise 11
2.4. Indicateur de Performance clé – Key Performance Indicator (KPI) 16
3. Méthodologie 20
3.1. Fonction d'agilité 20
3.2. Approche en 6 étapes 20
3.3. Application de notre modèle à une entreprise 25
4. Analyse des données et résultats 26
4.1. Étape 1 : Lister l'ensemble des KPIs issus de la revue de littérature 26
4.2. Étape 2 : Confirmer les KPIs en tant que KPIs valides 26
4.3. Étape 3 : Sélection des articles scientifiques les plus significatifs à partir de ScienceDirect. 27
4.4. Étape 4 : Trouver les mots-clés représentatifs des KPIs 27
4.5. Étape 5 : Pondération des KPIs via une analyse du corpus scientifique 27
4.6. Étape 6 : Élaboration d'une méthode de collecte de données 36
4.7. Utilisation de notre questionnaire et de notre évaluation des KPIs au sein d'une entreprise. 37
5. Discussion 41
5.1. La méthode TF-IDF convient-elle ? 41
5.2. Nos résultats sont-ils comparables avec l'article de référence de Wendler ? 41
5.3. Comment expliquer les différences entre Wendler et nos résultats ? 42

5.4. Ce mémoire remplit-il ces objectifs ? 42

6. Conclusion 43

Références 44

Annexes 55

Annexe 3.1. Étapes de notre méthodologie 55

Annexe 3.2. Code Python 56

Annexe 4.1. KPIs sélectionnés et justifications 131

Annexe 4.2. Titre et auteurs des articles sélectionnés 135

Annexe 4.3. Poids des KPIs 143

Annexe 4.4. Tableau récapitulatif des KPIs et de son importance selon la méthode par occurrence. 200

Annexe 4.5. KPIs non-significatif selon la méthode par occurrence. 202

Annexe 4.6. KPIs significatifs selon la méthode par fréquence 203

Annexe 4.7. KPIs non-significatif selon la méthode par fréquence. 205

Annexe 4.8. KPIs significatifs selon la méthode TF-IDF 206

Annexe 4.9. KPIs non-significatifs selon la méthode TF-IDF. 209

Annexe 4.10. Questionnaire 210

Annexe 4.11. Résultat de l'entreprise Solidaris aux questionnaires 215

Annexe 4.12. Radar des résultats par dimension 218

Annexe 4.13. Interview Solidaris 220

Comment définir des indicateurs clés de performance pour la mesure de l'agilité d'une entreprise ?

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Août 2023

1. Introduction

1.1.Contexte

Au cours des vingt dernières années, l'économie mondiale a connu des transformations significatives qui ont eu un impact profond sur la manière dont les organisations évoluent. (Letzing, 2019). « Le monde change à une vitesse folle. Le fort ne battra plus le faible. Dorénavant, ce sera le rapide qui battra le lent ». Voici une citation datant de 2013 de Rupert Murdoch, célèbre directeur et homme d'affaires australo-américain. Cette citation souligne l'importance du rythme rapide du changement dans le monde moderne et met l'accent sur la nécessité d'adapter rapidement les stratégies pour réussir dans un environnement en constante évolution.

Depuis, de nombreux événements et tendances ont modifié l'environnement des entreprises, contribuant à redéfinir la façon dont les entreprises fonctionnent. Les progrès technologiques ont ouvert la voie à une nouvelle économie numérique florissante. Avec l'explosion du commerce électronique, des géants de la Tech tels qu'Amazon, Google, Apple et Alibaba ont bouleversé les modèles traditionnels de vente au détail, créant de nouvelles opportunités tout en défiant les acteurs établis. Ce phénomène est induit par la croissance des nouvelles technologies de l'information et de communication (Philippe Lemoine, 2011). La pandémie mondiale de COVID19 a été un événement déterminant de ces dernières années. Les confinements, les restrictions de voyage et les fermetures d'entreprises ont eu un impact sans précédent sur le commerce, le tourisme et la production, accélérant l'achat par commerce électronique, la numérisation et les modèles de travail à distance. Selon Susmitha, l'expansion de l'e-commerce est due aux prix bas qu'on retrouve sur les achats sur internet, la facilité et le choix disponible. Ces qualités se retrouvent dans la plupart des grandes entreprises ci-dessous. (Susmitha, 2020). Selon Vaggelis, bien que le télétravail existait déjà avant la pandémie de COVID-19, celle-ci a néanmoins accru son utilisation. (Vaggelis Saprikis, 2022)

Dans ce contexte, les entreprises traditionnelles ont souvent du mal à s'adapter rapidement et efficacement aux nouvelles réalités. L'agilité d'une entreprise, en tant que capacité à s'adapter rapidement aux défis et opportunités changeants du marché, est un concept qui a émergé comme une réponse stratégique pour permettre aux organisations de rester compétitives dans un environnement

turbulent. Ce concept est désormais largement reconnu et recherché dans les milieux académiques et professionnels. Cependant, malgré son importance, l'évaluation de l'agilité d'une entreprise reste un défi complexe en raison de la nature multifacette du concept et du manque de mesures standardisées. (Wendler, The Structure of Agility from Different Perspectives, 2013)

1.2. Le défi de la mesure de l'agilité d'entreprise

Les entreprises ont toujours été confrontées à la nécessité de prendre des décisions éclairées pour assurer leur succès et leur croissance. Pour cela, elles se basent sur des données tangibles et des indicateurs pertinents pour évaluer leurs performances et leurs résultats. C'est dans cet objectif que les KPIs (Key Performance Indicators), ou Indicateurs Clés de Performance, ont été créés en tant qu'outils essentiels pour mesurer, évaluer et améliorer les performances opérationnelles et stratégiques des organisations. Au fil des années, l'utilisation des KPIs a gagné en importance et s'est répandue dans tous les secteurs d'activité, tant au niveau des petites que des grandes entreprises, à tel point de devenir un des piliers fondamentaux de la gestion d'entreprise. Plusieurs mesures de l'agilité d'une entreprise existent. Nous reprenons ci-dessous les principales méthodes de mesure citées par Roberto Moraga-Díaz, Andrés Leiva-Araos and José García. (Roberto Moraga-Díaz, 2023) : «

- Le CMMI for Agile est un ensemble de règles visant à améliorer la flexibilité des organisations. Il s'appuie sur le Capability Maturity Model Integration (CMMI), un cadre éprouvé pour mesurer et améliorer le niveau de maturité des entreprises.
- Le Quotient d'Agilité est une manière de mesurer la capacité d'une organisation à s'adapter au changement. Il se base sur la capacité de l'entreprise à répondre, apprendre et gérer les changements.
- Le Scaled Agile Framework (SAFe) est un guide pour appliquer l'agilité à grande échelle. Il propose des principes et des pratiques pour gérer des projets agiles d'envergure. Le SAFe utilise des mesures comme le nombre de fonctionnalités livrées par itération et le respect des délais et budgets.
- L'indice d'adoption agile évalue à quel point une organisation utilise les méthodes agiles. Il se base sur des pratiques comme les réunions quotidiennes et la planification de sprint.
- L'Agility Health Radar évalue l'agilité d'une organisation en examinant différentes facettes. Cela inclut des évaluations, des enquêtes et des analyses de données pour obtenir une vue complète de l'agilité. »

Cependant, se pose la question de la méthodologie de sélection parmi les différentes approches disponibles. Plutôt que de s'engager dans un simple acte de sélection, notre intention est de recourir

à la littérature scientifique pour ériger un modèle propre et spécifique de KPIs. Cette démarche s'inscrit dans la perspective de consulter les corpus de connaissances établis en vue d'avoir un cadre analytique robuste. Il convient de noter que l'entreprise d'extraction des KPIs les plus pertinents à partir du corpus de la littérature scientifique est une chose qui a déjà été entreprise par le passé. Ainsi, nous envisageons d'adopter, à titre de fondement, les articles rédigés par Wendler mais en y proposant des améliorations dans les techniques d'analyse de la littérature scientifique. **L'hypothèse avancée par Wendler, à laquelle nous souscrivons au sein de notre démarche, postule que l'exploitation de l'analyse du corpus littéraire relatif aux mesures de l'agilité d'entreprise facilitera l'édification d'un cadre modelé à partir de la totalité des schémas exposés dans la littérature** (Wendler, Dimensions of Organizational Agility in the Software and IT Service Industry : Insight from an Empirical Investigation, 2016) (Wendler, The Structure of Agility from Different Perspectives, 2013).

1.3. Objectif du mémoire

L'objectif de ce mémoire est de fournir une méthode de calcul de l'agilité d'entreprise, méthode de calcul qui sera basée sur des KPI efficients et pondérés sur la base d'une méthode statistique d'analyse de la littérature scientifique. Au niveau théorique, l'identification des KPIs spécifiques à l'agilité organisationnelle et leur poids relatif dans une note globale de l'agilité au travers de la littérature scientifique nous permettront d'établir un modèle solide et objectif. Au niveau empirique, pour les organisations, nous fournissons un ensemble d'indicateurs mesurables et objectifs qui permettront de quantifier l'agilité d'une entreprise. Notre méthodologie aidera les gestionnaires à évaluer l'efficacité des initiatives d'agilité en cours et à prendre des décisions éclairées pour promouvoir l'agilité au sein de leur organisation.

1.4. Cheminement suivi

Notre approche consistera à utiliser une méthodologie originale et innovante afin de déterminer les KPIs les plus significatifs pour mesurer l'agilité. Nous nous baserons sur la littérature scientifique et nous l'analyserons au travers de plusieurs méthodes statistiques afin d'arriver à construire une liste de KPIs déterminants. Nous construirons ensuite un questionnaire à utiliser au sein des entreprises en vue de mesurer les indicateurs. Pour éprouver notre méthode, nous l'utiliserons au sein d'une entreprise belge du secteur de la santé.

1.5. Contribution à la littérature scientifique

Ce mémoire contribue à la littérature scientifique en deux points. Premièrement, l'identification statistiques des KPIs permettant la mesure de l'agilité d'une entreprise sur un corpus de documents scientifiques plus récent et plus vaste que les méthodes précédentes, constitue un apport pour la littérature. Deuxièmement, une tentative de pondérer les indicateurs via la méthode TF-IDF est également une première.

Notre méthode permet l'établissement d'un score unique d'agilité d'entreprise et rend donc possible un classement et une comparaison des entreprises par rapport à l'agilité.

1.6. Structuration du mémoire

Ce mémoire est structuré de la manière suivante : tout d'abord, nous passerons en revue la littérature afin de déterminer les concepts importants de l'agilité, les notions de KPIs et les méthodologies de mesure des KPIs. Ensuite, nous décrirons une nouvelle méthodologie qui expliquera comment nous allons identifier les KPIs significatifs et répondre aux objectifs de ce mémoire. Nous poursuivons par une présentation des résultats de nos recherches. Nous confronterons le modèle avec un cas réel. Nous comparerons ensuite nos résultats avec un article de référence. Enfin, nous terminerons par une conclusion rappelant et synthétisant le contenu de ce mémoire et identifiant quelques pistes d'amélioration de notre méthode.

2. Revue de la littérature

2.1. Préambule

Dans ce chapitre, nous allons réaliser une revue de la littérature sur la notion d'agilité d'entreprise, sur les concepts de KPIs et sur les approches existantes dans la détermination des KPIs. Nous nous sommes appuyés sur « How to write a literature review » par Andrew S. Denny et Richard Tewksbury (Andrew S. Denney, 2013) et sur « Scientific Research in information systems: A beginner's Guide" par Jan Recker (Recker, 2013).

L'objectif de la revue de littérature est de donner une compréhension globale des sujets de notre question de recherche afin de préparer les chapitres suivants. Elle est fondamentale à la préparation du chapitre méthodologique. La revue de la littérature s'est basée sur trois sites : « Google Scholar », « ScienceDirect » et « ResearchGate ». Pour trouver les sources utiles à la revue de littérature, nous avons utilisé principalement la recherche par mots-clés. Ces sites font partie des sites les plus utilisés pour la recherche de littérature scientifique. De plus, ScienceDirect et ReseachGate recourent à la validation par des pairs, ce qui permet d'avoir une double validation scientifique. Pour chacun des trois sites, nous avons utilisé plusieurs mots-clés en fonction du résultat espéré ; par exemple, si nous voulions regarder l'influence du leadership sur l'agilité, les mots-clés utilisés étaient « agility , leadership, influence ».

2.2. Les définitions de l'agilité d'entreprise

La notion d'agilité au sein d'une entreprise est complexe. Elle se distingue des autres concepts d'agilité en raison de sa portée s'étendant à toute l'organisation plutôt qu'à des domaines spécifiques comme le développement logiciel ou la gestion de projet. Ainsi, pour bien appréhender cette notion, il est nécessaire de se référer à plusieurs définitions essentielles.

Selon Jorgen Hesselberg: "*Une entreprise agile est une organisation de personnes engagées qui se concentre sans relâche sur la valeur client, qui améliore continuellement sa façon de fonctionner et qui utilise l'empirisme pour adopter rapidement le changement de manière durable."* (Hesselberg, 2018). Cette définition met en lumière la manière dont une entreprise peut être agile, sans toutefois préciser les dimensions de l'entreprise qui favorisent cette agilité. Pourtant, afin de définir des indicateurs clés de performance, relatifs à l'agilité, il est fondamental d'identifier ces dimensions. D'autres définitions nous aident à accomplir cette tâche. "*L'agilité organisationnelle est définie comme une capacité dynamique d'ordre élevé qui aide les entreprises à survivre dans des environnements commerciaux en constante évolution et inattendus en se référant à la capacité d'une entreprise à reconnaître et à s'adapter rapidement aux changements environnementaux*" (Hongyi

Mao, 2015). Dans cette définition, Hongyi Mao met l'accent sur une **organisation des capacités de l'entreprise** permettant de s'adapter aux changements de l'environnement.

Une troisième définition nous est donnée par Daniel Brosseau : "*Les organisations agiles sont caractérisées comme un réseau d'équipes opérant dans des cycles d'apprentissage et de prise de décision rapides.* » (Daniel Brosseau, 2019). Cette définition souligne l'importance des **aspects humains et les processus au sein des équipes.**

Une quatrième définition complète les précédentes : "*Les organisations agiles sont conçues pour la stabilité et le dynamisme. Elles sont constituées d'un réseau d'équipes au sein d'une culture centrée sur les personnes, réseau qui permet un apprentissage rapide et des cycles de décision rapides rendus possibles par la technologie et guidés par un objectif commun puissant pour créer de la valeur pour toutes les parties prenantes*" (Lucia Darino, 2019). Cette définition ajoute clairement les **dimensions culturelles et technologiques** à l'agilité mais sous-entend également une notion de **leadership** (*guidés par un objectif commun puissant*).

Enfin, une dernière définition, "*L'agilité d'entreprise est un concept complexe, multidimensionnel et spécifique au contexte, comprenant la capacité de détecter les changements environnementaux et de réagir rapidement aux changements imprévus en rassemblant de manière flexible les ressources, les processus, les connaissances et les capacités*" (Chyan Yang, 2012), insiste sur l'**aspect multidimensionnel** de l'agilité.

2.3. Les cinq dimensions de l'agilité d'entreprise

Au vu de la littérature, il ressort qu'il convient d'analyser et de comprendre l'agilité au sein d'un système via cinq dimensions majeures : la technologie, l'organisation, les personnes, le leadership et la culture. Cette structuration, également utilisée par Jorgen Hesselberg dans sa recherche (Hesselberg, 2018), sera empruntée dans le cadre de ce mémoire. L'exploration des différentes dimensions nous aidera à identifier les attributs spécifiques de ces dimensions qui contribuent à promouvoir l'agilité au sein de l'entreprise. À partir de ces attributs, nous serons en mesure de définir les indicateurs clés de performance (KPIs).

Technologies

Dans son ouvrage "The Wiley Handbook of Learning Technology", Nick Rushby s'est attelé à définir la technologie, une tâche qui s'est révélée ardue. Malgré cela, il parvient à cerner la technologie en mettant en avant ses diverses manifestations, telles que les artefacts, les connaissances, les activités et les valeurs. En somme, la technologie peut être interprétée comme un moyen de défier le monde et de réduire son emprise en tant que source inépuisable de ressources. « *Elle peut être comprise comme une force causale, faisant de l'apprentissage un lieu de lutte politique. Elle peut également être*

comprise comme la trace matérielle de l'action sociale, comme faisant partie des réseaux hétérogènes qui font la société, et ainsi de suite » (Nick Rushby, 2016). Marcel Mauss apporte une perspective complémentaire, considérant la technologie comme la science des techniques humaines (Mauss, 2004). Jorgen Hesselberg propose également sa propre définition de la technologie dans le contexte de l'agilité en entreprise. Il la résume de manière globale comme les "*outils, techniques et méthodes visant à libérer l'agilité*". Cette vision élargie de la technologie englobe même les méthodologies associées à l'agilité en entreprise. Parmi les méthodologies agiles issues du domaine informatique, deux se sont répandues dans les entreprises et services IT : Scrum et Kanban. Scrum se base sur la division organisationnelle, temporelle et conceptuelle du travail, optimisant les priorités et les processus. Elle introduit également le rôle du scrum master, qui incarne neuf fonctions de leadership (Moe, 480-491), évoluant en fonction de la maturité de l'équipe (Simone V. Spiegler, 2019). Selon Asana[1], en s'appuyant sur le manifeste agile, les valeurs primordiales d'une équipe Scrum sont l'engagement, le courage, la concentration, l'ouverture et le respect. Kanban se fonde sur la visualisation et la régulation du flux de travail, ainsi que la mesure du temps requis pour réaliser une tâche (Henrik Kniberg, 2010), en soulignant l'importance de repérer les goulots d'étranglement et de communiquer les priorités (Cloud Software Finland, 2014). Bien que conçue à l'origine en 1940 pour optimiser la production automobile, Kanban s'est adaptée au monde contemporain dans les années 2000 grâce à des ouvrages clés tels que « Kanban » écrit par David D. Anderson. (Ladas, 2009). D'autres méthodologies agiles, principalement employées par les équipes de développement IT, ont émergé depuis les années 2000. Une méthodologie appelée Scrumban fusionne les deux méthodes précédentes (Krunal Bhavsar, 2020). On peut également citer les méthodes Extreme Programming (XP) et Value Stream Mapping (VSM), favorisant l'évolution agile des entreprises (Xiaofeng Wang, 2012). La technologie influence également la flexibilité de la production (qualité, vitesse) et la gestion des ressources humaines, contribuant ainsi à rendre les entreprises plus flexibles et agiles (Dahou Hacini Khadra). Une étude menée à São Paulo a comparé les industries adoptant de nouvelles technologies à celles qui ne le font pas, dégageant des résultats dont notamment une collaboration entre entreprises plus fluide et une meilleure compréhension des avantages des nouvelles technologies (Antonio Arnaldo Baio Junior, 2022). **En résumé, dans la dimension technologique, l'utilisation des méthodologies agiles et leurs implications, l'amélioration de la qualité et des processus informatiques, ainsi que l'adoption des nouvelles technologies, en particulier dans la communication, sont des éléments prépondérants de l'agilité d'entreprise.**

[1] https://asana.com/fr/ressource/what-is-scrum

Organisation

L'organisation est une notion assez large, nous allons la diviser en deux types : l'organisation physique au sein d'une entreprise et la structure organisationnelle d'une entreprise.

L'organisation physique d'une entreprise

Au fil d'une vie, nous consacrons en moyenne plus de 90 000 heures à notre lieu de travail, ce qui souligne l'importance de s'y sentir à l'aise (Everett, 2011). Une connexion positive entre le bien-être au travail et la performance des employés a été établie. En effet, des recherches ont démontré que l'amélioration des conditions physiques de travail est souvent associée à une meilleure performance et à une plus grande satisfaction au travail (Jurvansuu, Assessing the economic value of developing an healthy work environnement, 2000). L'impact de l'environnement de travail sur la performance est même considéré comme supérieur à celui du stress ou de la mécontentement professionnel (Roelofsen, 2002). John Cooper et Dean Patterson ont même montré que la mise en place de programmes visant à améliorer la qualité de vie au travail engendre une augmentation du niveau d'énergie chez la majorité des employés (John Cooper, 2008). Selon Wahjoedi, l'environnement de travail influence également la performance d'un employé. (Wahjoedi, 2023). Un environnement de travail optimal présente diverses caractéristiques, dont la température (ASHRAE, 2004), l'aspect visuel (standardization, 2002), le confort sonore (Navai M, 2003) ou encore la qualité de l'air (ASHRAE, The Standards for Ventilation and Indoor Air Quality, 2007). Ces paramètres contribuent au bien-être des employés, améliorant ainsi leur performance et leur motivation au travail. Cela s'étend également à l'attitude au travail, où une bonne posture peut par exemple favoriser la performance (Wahjoedi, 2023). L'humain joue un rôle central dans l'agilité de l'entreprise et la communication est un élément clé de cette dynamique. La communication au travail implique le transfert de sens et d'idées entre individus (Wahjoedi, 2023). Elle favorise également l'établissement et l'amélioration des relations professionnelles, un facteur qui influence la performance des employés. Dans ce contexte, l'environnement de travail joue un rôle important, puisqu'il contribue à encourager une communication efficace. Il devrait permettre le partage des connaissances, favorisant ainsi l'apprentissage continu. Toutefois, il est également crucial d'offrir des espaces de concentration pour assurer une communication de qualité (Wahjoedi, 2023). Concernant le bruit, il est intéressant de noter que le bruit généré par les collègues travaillant sur un même projet au sein d'une même équipe n'affecte pas négativement la performance des employés. Toutefois, il est essentiel de prévoir des salles de réunion isolées pour les discussions et les appels, sans perturber le reste de l'espace de travail. (Hesselberg, 2018). Lorsqu'il s'agit de communication, la préférence va souvent vers le contact en personne, qui améliore la qualité des échanges, même si cela implique un certain coût en termes de

temps (Diego Battiston, 2020). Cependant, la communication virtuelle peut également être bénéfique, à condition que les technologies de l'entreprise soient adaptées.

La structure organisationnelle d'une entreprise

John Kotter disait des organisations qu'avec le rythme de changements dans notre monde, les organisations du siècle précédent ne peuvent plus suivre. (Kotter, 2014). Selon lui, un besoin de changement est donc nécessaire pour survivre. Dans le contexte du domaine bancaire, Wischnevsky a mis en évidence l'importance cruciale d'une transformation structurelle pour la survie d'une entreprise (Wischnevsky, 2004). L'agence des programmes de recherches avancés (ARPA) définit simplement l'agilité organisationnelle comme « *la capacité de fonctionner et de rivaliser dans un état de changement dynamique, continu et souvent imprévu* ». Une structure agile favorise des attributs comme « *la proactivité, l'adaptabilité, la flexibilité et l'apprentissage* » (Meredith, 2000) ou encore des capacités de coordination et coopération (Ranjay, 2007). Les avancées technologiques ont considérablement influencé les structures organisationnelles. L'ère numérique, par exemple, a encouragé l'émergence de structures plus horizontales et flexibles, permettant une communication et une collaboration plus fluides entre les membres du personnel (Ali Akbar Farhanghi, 2013). Le travail d'équipe représente un élément vital de l'agilité organisationnelle au sein d'une entreprise. Cinq principaux aspects le définissent : la gestion d'équipe, la surveillance mutuelle des performances, les comportements de soutien et d'interrogation, l'adaptabilité et l'orientation de l'équipe (Nils Brede Moe, 2008). Il est important aussi de considérer qu'il existe certains challenges ou freins, concernant la structure organisationnelle agile, notamment la résistance aux changements. (Ghimire, 2020)

Ainsi, dans la dimension organisationnelle, un environnement de travail flexible et adaptable, la communication au sein de l'entreprise et une structure organisationnelle par le découpage en équipes et les avantages qui en découlent, sont des éléments prépondérants de l'agilité d'entreprise.

Les personnes

Hesselberg a identifié un concept crucial pour s'adapter à la méthodologie agile : le "Grown Mindset". Cette mentalité se caractérise par l'appréciation des défis et la capacité à accepter l'échec sans crainte. Ce type de mentalité est particulièrement requis par les méthodes agiles, car il embrasse le changement et s'adapte rapidement, une exigence essentielle pour les organisations dans un environnement VUCA (Volatility, Uncertainty, Complexity and Ambiguity). (Hesselberg, Unlocking Agility : An Insider's Guide To Agile Entreprise Transformation, 2018). Hesselberg souligne que les profils des individus ne sont pas figés et qu'il est possible de provoquer des changements chez les personnes pour les rendre plus enclines à accepter l'erreur et le changement. La remise en question des employés sur le travail effectué et son importance pour la société apportent plus d'agilité. (Lisiane

Sassi Ferreira, 2022). D'ailleurs, les qualités les plus importantes que doit avoir un employé dans un système agile est la capacité à travailler en équipe, des compétences individuelles liées à son travail et la motivation (Martina Ceschi, 2005). La motivation des personnes est également retrouvée dans les traits importants que toute équipe agile doit avoir (Badri Srinivasan, 2015). L'introduction de la flexibilité horaire apporte des avantages considérables en termes de productivité. Ainsi, offrir une marge de manœuvre aux individus pour accroître leur agilité se révèle pertinent (John, 2017). Selon Alistair, la diversité permet d'améliorer une équipe (Alistair, 2007). Ainsi, une équipe hétérogène répond et performe de manière plus efficace, notamment pour des tâches complexes (Fabian Baumann, 2023).

Ainsi, dans la dimension personnes, la diversité au sein des équipes, la flexibilité quant au travail, un mindset adapté et la formation des employés sont des éléments prépondérants de l'agilité d'entreprise.

Le leadership

Dans le cas d'un choix de personnes pour une position de leader, plusieurs éléments rentrent en considérations. Selon Sara Alhassan et Mohammed A. Al Doghan, la culture, le genre, le comportement et le style jouent un rôle pour déterminer si une personne peut avoir accès aux positions de leader. Selon Bill Joiner et Stephen Josephs, il y a quatre compétences essentielles au leadership agile. Celles-ci sont « Self-Leadership agility, creative-setting agility, stakeholder agility and creative agility". Ces auteurs soulignent la nécessité d'évolution des managements classiques vers l'agilité en encourageant le coaching, les ateliers de travail et les programmes de formations. (Bill Joiner, 2007)

Dans l'optique de former des bons managers agiles (Wilson, 2021), des programmes comme le programme CARE ont émergé. CARE est constitué à 40% de formations de développement pour les skills émotionnels, à 40% pour des pratiques qui permettent de réduire les stress et des pratiques de compassion (Jennings, 2013). Parfois, les personnes sont divisées en plus petites équipes qui sont autogérées. Dans ces équipes, le leadership le plus flagrant est le leadership à travers la participation, ce qui rend la prise de décision beaucoup plus facile et rapide (Badri Srinivasan, 2015).

Ainsi, dans la dimension leadership, un leadership dans lequel beaucoup de personnes participent, un besoin de diversité et de non-discriminations dans les postes à gestion, les formations et la confiance liée à la gestion sont des éléments prépondérants de l'agilité d'entreprise.

La culture

La culture agile crée un environnement fortement compétitif qui entraîne des répercussions culturelles, politiques et sociales. Une culture organisationnelle appropriée au développement agile a

été identifiée, et des exemples de pays qui favorisent ce type de culture ont été présentés. (Kerstin V. Siakas, 2007)

La culture d'entreprise joue un rôle primordial dans l'agilité car elle a un impact sur plusieurs choses comme la productivité, la communication, la cohésion d'équipe et même la satisfaction du client (Genç, 2013). Selon Pinto, elle permet également d'augmenter le taux de succès quant à la réalisation d'un projet (Pinto, 2010). Selon Hanen Ben Othman, Mahmo ud Zouaoui, Moham ed Hamdoun, trois types de cultures sont propices à la culture agile : la culture de groupe, la culture de développement et la culture rationnelle. Celle qui ne correspond pas aux méthodologies agiles est la culture hiérarchique (Selon Hanen Ben Othman, 2016). Cette non-adhésion de la culture hiérarchique aux critères agiles est dû à un excès de contrôle et à une restriction d'autonomie qui tendent à casser la cohésion d'équipe. (Baham, 2016). Jivan, K.P., Marnewick, A.L., and Joseph, N. ont déterminé quatre types de culture : la culture du marché, la culture de clan, la culture d'adhocratie et la culture hiérarchique. Pour ces auteurs, l'adhocratie possède la dernière place dans l'adéquation des méthodologies agiles. (Jivan, 2020).

Les cultures qui favorisent la collaboration, la structure flexible, la communication et le partage de connaissances ainsi que pour l'adaptation individuelle sont les plus agiles. (Hesselberg, Unlocking Agility : An Insider's Guide To Agile Entreprise Transformation, 2018).

Ainsi, dans la dimension culture, l'importance d'avoir et de transmettre ses valeurs, le partage de connaissance et l'amélioration continue ainsi que la satisfaction de l'employé sont des éléments prépondérants de l'agilité d'entreprise.

2.4.Indicateur de Performance clé – Key Performance Indicator (KPI)

Définition de KPIs

L'environnement concurrentiel a fait de la construction des KPIs pour une entreprise un must. (A. del-Río-Ortega, 2013)

Une première définition du concept de KPI est "*Un KPI est une mesure qui évalue comment une entreprise exécute sa vision stratégique.*" (Warren, 2011)

De manière plus large, une définition libre dit : "*Une façon de mesurer les progrès d'une entreprise vers les objectifs qu'elle tente d'atteindre : 1. Un KPI est une mesure de performance pour une activité commerciale spécifique. 2. Les indicateurs de rendement clés (IRC) indiquent aux gestionnaires qu'il pourrait y avoir des problèmes à venir."* (Cambridge Dictionary)

On retrouve ces mêmes idées dans la définition apportée par Ahmet Rasim Mazlum, professeur à l'Université d'Istanbul : « *Un indicateur de performance clé (KPI) est une mesure de l'activité qui*

met en évidence la performance d'une entreprise ou d'une équipe par rapport à ses objectifs stratégiques. Les indicateurs clés de performance sont les mesures les plus critiques qui mesurent le succès d'activités spécifiques utilisées pour définir le succès et suivre les progrès dans l'atteinte des objectifs organisationnels. »

De manière plus précise, les KPIs sont importants pour le contrôle et la gestion des tâches au sein d'un système. Les KPIs améliorent grandement la communication et la transparence permettant également de prendre des meilleures décisions (Horst Meier, 2013).

Les KPIs sont des messages, modélisés en nombres qui permettent de comprendre de manière efficace les caractéristiques importantes utilisées dans une entreprise. (Few, 2004). Cette définition est confirmée par la vision de Vaisman et Zymanyi dans leur livre. Pour eux, les KPIs sont simplement « *des objectifs organisationnels mesurables qui servent à caractériser le rendement d'une organisation*. » (Alejandro Vaisman, 2014). Ils aident les entreprises à atteindre leurs objectifs fixés. (Parmenter, 2007) Les KPIs peuvent être utiliser pour deux choses : l'évaluation comprenant la connaissance de résultats ou des actions dérivées par rapport à ceux-ci ou la prédiction (Eladio Domínguez, 2019). Dans les entreprises, les KPIs peuvent également être financiers comme le chiffre d'affaires et non financiers comme la satisfaction des clients. Les deux doivent être pris en compte si on mesure la santé d'une entreprise bien que ce ne soit pas toujours le cas. (Laura Bini, 2019).

En conséquence, en complément des KPIs provenant des cinq dimensions, nous intégrerons à notre méthodologie des KPIs liés aux chiffres d'affaires et à la satisfaction des clients.

Modélisation d'un KPI

La modélisation d'un KPI dans une entreprise est une tâche vraiment complexe car cela mélange de nombreux domaines, tant dans le côté business de l'entreprise que dans l'analyse statistique. (K. Letrache, 2016).

Plusieurs modèles existent dans la littérature pour modéliser des KPI. Un premier exemple est le COBIT (Control Objectives for Information and Related Technologies). Le framework COBIT est un cadre de gouvernance informatique pour les entreprises qui souhaitent mettre en œuvre, surveiller et améliorer les meilleures pratiques de gestion informatique. (Brad Tuttle, 2007). Étant limité aux aspects informatiques, il ne peut être exploité tel quel pour mesurer l'agilité d'une entreprise.

Un deuxième modèle bien connu est celui de concept de tableau de bord développé par Robert S. Kaplan et David P. Norton. C'est un bon cadre pour réaliser un suivi de performance stratégique, mais il n'est pas conçu pour mesurer l'agilité de l'entreprise. (Robert S. Kaplan, 2003)

Une troisième méthode connue pour la création d'un KPI est la méthode « Measure-Perform-

Review-Adapt ». Celle-ci est composée de plusieurs étapes allant de l'identification des objectifs à la définition et la documentation des KPIs. Cette méthode a été créée par le BSI (Balanced Scorecard Institutes). Toutefois, cette approche met fortement l'accent sur les mesures quantitatives, qui peuvent ne pas saisir pleinement les aspects qualitatifs de l'agilité d'une entreprise, tels que l'expérience utilisateur, le moral de l'équipe ou la créativité. Cette troisième méthode paraît donc trop limitative dans le cadre de ce mémoire.

Selon Parmenter, il faut 6 phases à la création du KPIs :la délimitation, la conception, la mise en œuvre, la collecte des données, l'analyse des données et la révision. (Parmenter, 2007)

Nous n'avons trouvé aucun frameworks satisfaisant. Nous allons dès lors poursuivre la revue de la littérature en mettant en évidence les bonnes pratiques pour construire une méthodologie originale.

Bonnes pratiques quant à la définition des KPIs

Pour Kenny, il faut cibler l'impact du KPI. Il n'est pas nécessaire de créer différents KPIs pour un seul type de clients. Il faut également tester les informations que l'on reçoit. Enfin, la structure des KPIs est très importante. Il faut bien se rendre compte vers quel type de personnes s'adressent les KPIs. (Kenny, 2020)

Selon Hamel, il reste important de savoir prouver, mesurer notre KPI avec précision et certitude et en étant objectif (Hamel G., 1994). Même si malgré nos efforts, il existera toujours une partie subjective dans ceux-ci (Meng X., 2011).

Selon Vaisman et Zymani, il existe certaines caractéristiques que doit avoir chaque KPI. Ainsi, les KPIs doivent être spécifiques, non ambigus, mesurables, gérés dans le temps, bien définis. Ils doivent refléter les objectifs de l'entreprise. Et enfin, ils doivent être gérables (Alejandro Vaisman, 2014). Toujours selon Vaisman et Zyamni, il serait important de venir comparer la valeur d'un KPI car "*pour soutenir la prise de décision, les KPI ont généralement une valeur actuelle qui est comparée à une valeur cible, une valeur seuil et une valeur minimale. Toutes ces valeurs sont généralement normalisées, pour faciliter l'interprétation*". Ainsi, il serait intéressant de correctement savoir le nom du KPI, sa tendance, sa valeur réelle et cible, sa variance et enfin, son pourcentage de variation.

On retrouve certains points communs dans les caractéristiques proposées par Viara Popova et Alexei Sharpanskykh. En effet, ces auteurs prônent l'importance d'avoir un nom, une définition, un type, un indice de temps, une échelle, une valeur minimale ou maximale, une source, ainsi qu'un seuil et une difficulté pour tous les indicateurs de performance. De plus, chaque KPI doit avoir une personne de référence, qui s'occupe de la mesure. (Viara Popova, 2010)

Dans leur article, les auteurs Thibaut Ferraille, Christian Kerbiriou, Charlotte Bigard, Fabien Claireau, John D. Thompson démontrent l'importance des sources de données. Ils évaluent d'ailleurs

chaque source de données sous deux points : sa disponibilité et sa pertinence ou fiabilité. (Thibaut Ferraille, 2023)

Une dernière caractéristique d'un KPI est mise en lumière par les auteurs Yang, Baik, Petrou et Zariq. Ils terminent leur article en rappelant que la définition d'un KPI doit être avantageuse pour une entreprise, c'est-à-dire que les avantages liés à la mesure du KPI doivent être plus importants que les coûts liés à cette mesure. De plus, chaque KPI représente un coût différent par sa mesurabilité.

Finalement, nous retirons de la littérature que pour qu'un KPI soit efficient, sa source doit être disponible et pertinente, sa mesurabilité ne doit pas trop être complexe, il doit être facilement compréhensible, il doit pouvoir évoluer dans le temps et il doit être comparable.

3. Méthodologie

L'objectif de ce mémoire est de trouver une mesure correcte et objective de l'agilité, en trouvant, d'une part, les différents KPIs qui peuvent la mesurer et, d'autre part, en évaluant le poids de chaque KPI dans l'évaluation globale de l'agilité d'entreprise. Le chapitre 3 permettra de comprendre le cheminement entre la revue de littérature effectuée au chapitre 2 et l'équation pondérée de l'agilité qui sera présentée dans le chapitre 4.

Notre démarche repose sur le principe suivant : une dimension sera composée de ses KPIs, lesquels seront représentés par des mots clés spécifiques. En évaluant l'importance des mots clés au sein d'un corpus scientifique, nous pourrons estimer la valeur des KPIs. Une fois regroupés au sein de leur dimension respective, ces KPIs contribueront à l'évaluation d'un score global pour ladite dimension.

3.1. Fonction d'agilité

Il ressort de la revue de la littérature que l'agilité d'entreprise est une notion complexe, multidimensionnelle (nous en avons retenu cinq) et que chaque dimension reprend différents KPI. Pour cette raison, nous allons tenter de traduire le niveau d'agilité en une fonction complexe basée sur les KPIs.

À première vue, on pourrait considérer que l'ensemble de nos KPIs ont une même importance quant à l'agilité d'une entreprise. Dans cette hypothèse, une première fonction de l'agilité serait :

$$\text{Eq. (1)} : Agility = \sum_{i=1}^{n} \frac{1}{n} * KPI(i)$$

Cependant, nous prendrons l'hypothèse que l'agilité ne dépend pas nécessairement équitablement de nos n KPIs et ce qui permet que certains KPIs puissent avoir plus d'influence que d'autres. Notre fonction devient donc :

$$\text{Eq. (2)} : Agility = \sum_{i=1}^{n} a(i) * KPI(i)$$

Où a(i) est le poids relatif du KPI(i)

La fonction d'agilité dépend donc de 2 variables, les KPIs et les poids des KPIs.

3.2. Approche en 6 étapes

Dans ce chapitre, nous définissons une méthode claire et objective permettant le calcul d'un score de l'agilité. Pour ce faire, nous passons par 6 étapes. Pour permettre une meilleure compréhension de

chaque étape, les résultats sont clairement indiqués pour chacune de ses étapes. Un schéma rappelant ses étapes se trouve également à **l'annexe 3.1.**

Étape 1 : Lister l'ensemble des KPIs issus de la revue de littérature

La première étape consiste à lister l'ensemble des KPIs éligibles sur bases des attributs des 5 dimensions identifiés dans la revue de littérature et de les relier à chacune des dimensions. Nous ajoutons les KPI relatifs aux chiffres d'affaires et aux clients, comme proposé par Laura Bini (Laura Bini, 2019).

Étape 2 : Confirmer les KPIs en tant que KPIs valides

La deuxième étape consistera à vérifier si les KPIs éligibles correspondent aux critères permettant de définir ce qu'est un bon KPI. (Voir section supra liée aux bonnes pratiques quant à la définition des KPIs).

Étape 3 : Sélection des articles scientifiques les plus significatifs à partir de ScienceDirect

Afin de déterminer le poids relatif de chaque KPI, une première approche pourrait être de demander aux entreprises, communément reconnues comme agiles ou celles qui se perçoivent comme telles, de communiquer les attributs de l'agilité les plus significatifs et de les scorer. Cette méthode ne sera pas utilisée dans le cadre ce mémoire, d'une part parce que les données sont difficilement accessibles, d'autre part, parce qu'il y a une différence entre l'agilité réelle et l'agilité perçue. (Roy Wendler, 2013)

Une autre approche consiste à analyser la littérature scientifique existante. (Wendler, 2013) (Wendler, Dimensions of Organizational Agility in the Software and IT Service Industry : Insight from an Empirical Investigation, 2016). **C'est l'approche que nous avons choisie, nous allons par conséquent tenter de construire un corpus d'articles les plus significatifs concernant l'agilité d'entreprises pour ensuite les analyser.**

Pour assembler nos données, nous recherchons les articles sur le site ScienceDirect et ce, pour plusieurs raisons. Tout d'abord, c'est un site reconnu dans la publication de la littérature scientifique. Ensuite, le site permet de trier les articles par relevance via un algorithme performant[2]. De plus, le site bénéficie d'une validation par les pairs, rendant la relevance plus pertinente. Enfin, le site a une fonctionnalité capable de télécharger les articles sous forme de dossier zip. Le téléchargement groupé

[2] https://service.elsevier.com/app/answers/detail/a_id/25974/supporthub/sciencedirect/

de ces articles est donc très facile pour notre recherche. **Pour des raisons de performance de calculs réalisés par la suite, nous nous sommes limités aux 50 premiers articles d'articles (représentés par des documents pdf) triés par la relevance pour chacune des questions.**

Étape 4 : Trouver les mots-clés pour rechercher représentatifs des KPI

Afin de trouver l'importance des KPIs dans la littérature, nous avons dû passer par de la recherche par mots clés. Étant donné que nos méthodes statistiques de recherche dans les articles peuvent utiliser plusieurs séries de caractères, nous pouvions considérer un nombre important de mots clés pour rechercher l'importance d'un KPI au sein du corpus scientifique sélectionné en étape 3.

Dès lors, pour trouver l'ensemble de ces mots clés, nous nous sommes aidés de l'intelligence artificielle « Chat GPT 3.5 ». Nous lui avons demandé de nous donner, pour chaque KPIs, au maximum les 50 mots clés les plus significatifs. Pour chaque KPI, nous aurons jusqu'à 50 mots clés à notre disposition pour les recherches statistiques.

Chacun de ces mots clés, identifiés par ChatGPT, sera utilisé comme chaîne de caractères lors des recherches. En considérant tous les résultats associés à ces mots clés pour chaque KPI, nous pourrons calculer un score global pour évaluer les performances de ce KPI.

Étape 5 : Méthodes de pondération des KPIs via une analyse du corpus scientifique

La pondération des KPI revêt une importance cruciale dans notre approche car notre hypothèse est qu'il n'y a pas de raisons que tous les KPI exercent la même influence sur l'agilité de l'entreprise.

Wendler ne pondère pas l'importance des KPIs de l'agilité via la littérature. Il mentionne seulement si un attribut apparait dans les articles. Or, ce que nous cherchons, c'est l'importance d'un KPI dans la littérature scientifique.

A des fins de comparaison avec les résultats de Wendler et pour affiner nos résultats, nous allons utiliser différentes méthodes d'analyse.

La première méthode, comparable à celle utilisée par Wendler (Wendler, The Structure of Agility from Different Perspectives, 2013), est la méthode par occurrence, à savoir le nombre d'articles dans lesquels un KPI (via ses mots clés) apparait au moins une fois.

La deuxième méthode consistera à analyser la fréquence du KPI dans la littérature, c'est-à-dire le nombre de fois qu'un KPI apparait dans l'ensemble du corpus analysé. En effet, contrairement à l'occurrence isolée, qui pourrait ne refléter qu'une occurrence singulière sans égard à sa répétition ou son usage récurrent, la fréquence fournit une évaluation plus nuancée de l'importance relative d'un terme. Cette approche prend en compte le fait que la répétition d'un terme à travers différents

contextes et documents peut signifier qu'il joue un rôle fondamental dans la discussion et la description d'un certain sujet. (Christopher D. Manning, 1999).

Une troisième méthode, plus précise encore, consiste à utiliser la méthode TF-IDF, (Term Frequency-Inverse Document Frequency) qui est une mesure utilisée en traitement automatique du langage naturel et en récupération d'information pour évaluer l'importance d'un terme (mot) dans un ensemble de documents et qui sera expliquée plus en détail par la suite. (Shahzad Qaiser, 2018).

En résumé, pour pondérer les KPIs, nous passerons par trois analyses statistiques du corpus littéraire sur base des mots clés déterminés en étape 4 : l'occurrence en tant que nombre d'articles du corpus scientifique sélectionné dans lesquels un KPI se retrouve, la fréquence d'apparition des KPIs dans l'ensemble des articles du corpus scientifique sélectionné et enfin, la méthode TF-IDF.

La méthode de pondération par occurrence

Cette méthode est utilisée par Wendler pour identifier les KPIs sur la base de 28 méthodes de mesure de KPIs. (Wendler, Dimensions of Organizational Agility in the Software and IT Service Industry : Insight from an Empirical Investigation, 2016)

Dans cette méthode, nous allons utiliser le nombre d'articles dans lequel un KPI apparait par ses mots clés. L'occurrence est donc définie comme :

$$\text{Eq. (3)} : Binaire_mc(mots_clés, i) = \begin{cases} 1 \; si \; mots_clés \in i \\ 0 \; sinon \end{cases}$$

L'équation 3 représente la valeur binaire de l'apparition d'au moins un mot-clé d'un KPI dans un texte. $binaire_mc$ est égale à 1 seulement dans le cas où au moins un mot-clé apparait dans le texte i. L'équation 4 représente la somme des apparitions de l'ensemble des mots-clés décrivant le même KPI dans le texte i.

$$\text{Eq. (4)} : Binaire_KPI(KPIs, i) = \sum_{j=1}^{n} Binaire_mc(j, i)$$

À la vue de la nature multidimensionnelle de l'agilité, il n'est pas opportun de considérer l'agilité comme une variable binaire mais plutôt comme un pourcentage de 0 à 100 d'agilité dans une entreprise. Du coup, nous calculons l'occurrence relative via la méthode suivante :

$$\text{Eq. (5)} : poids(KPI) = \frac{Binaire_KPI(KPIs,i)}{Total}$$

Dans cette équation, le terme total représente la somme de tous les $binaire_KPI$ pour tous les mots de tous les KPIs dans tous les textes.

Par la suite, nous calculerons à chaque fois les mesures relatives.

La méthode de pondération par fréquence

Nous définissons la fréquence d'un KPI comme la somme d'apparition de l'ensemble de ses mots-clés, divisé par la somme des mots analysés. Nous utiliserons les mêmes notations que pour la section précédente.

$$\text{Eq. (6)} : \#(KPI) = \sum_{i=1}^{m} \sum_{j=1}^{n} mots_clés(i,j)$$

Ensuite, nous multiplions cette occurrence d'un mot par le nombre de fichiers dans lequel les mots-clés apparaissent. Cette dernière équation représente la méthode de pondération par fréquence. Elle est égale au produit de l'occurrence d'un KPI et la somme de Binaire_KPI pour tous les textes.

$$\text{Eq. (7)} : importance(KPI) = \#(KPI) * \sum_{i=1}^{m} Binaire_KPI(KPI,i)$$

Comme on recherche à obtenir une valeur de l'agilité entre 0 et 1, nous utiliserons la fréquence relative. Nous divisons l'importance des KPIs par la somme des importances de tous les KPIs comme pour la méthode précédente.

La méthode de pondération par TF-IDF

Cette méthode permet de mesurer l'importance d'un mot dans un document en fonction de sa fréquence et du nombre total de documents dans lesquels il apparait. Cette méthode est particulièrement utilisée pour de l'analyse de textes et de la recherche dans ceux-ci (Shahad Qaiser, 2018). Contrairement à la méthode de pondération par fréquence, par sa formule, cette méthode se concentre sur les mots le plus importants et moins fréquents. (Prafulla Bafna, 2016)

L'importance du mot est définie grâce aux formules suivantes :

$$\text{Eq. (8)} : \text{TF_IDF}\ (i,j) = tf(i,j) * idf(i)$$

$$\text{Eq. (9)} : tf\ (i,j) = \frac{n(i,j)}{\sum_k n(k,j)}$$

$$\text{Eq. (10)} : idf(i) = \log \frac{|D|}{\{d(j):t(i)\in d(j)\}}$$

Le calcul du TF-IDF (8) est le produit de la fréquence du mot i dans le texte j ($tf(i,j)$ par la fréquence inverse du document $idf(i)$. $idf(i)$ permet de pondérer les poids des mots en donnant de l'importance aux mots qui apparaissent moins et retirant de l'importance aux mots qui apparaissent le plus. (Tripti Dodiya, 2021)

La fréquence d'un mot i dans le texte j ($tf(i,j)$ représente le nombre d'occurrence du mot i dans le texte j divisé par l'ensemble des mots que contient le texte j (9).

La fréquence inverse du document $idf(i)$ est calculée sur base d'une fonction logarithmique (10). Dans cette équation, |D| représente le nombre total de documents. Le dénominateur calcule le nombre de fois que le mot i apparait dans l'ensemble des documents.

L'importance d'un KPI sera donc la somme des TF-IDF de chacun de ses mots clés pour chacun des documents.

Le terme $TF_IDF(mots_clés(i,j))$ représente la valeur TF-IDF du mot-clé j pour le texte i. Le terme m représente l'ensemble d'articles et le terme n représente l'ensemble des mots-clés utilisés pour définir le KPI dans notre recherche dans la littérature.

Eq. (11) : $Importance(KPI) = \sum_{i=1}^{m} \sum_{j=1}^{n} TFIDF(mots_clés(i,j))$

Afin d'avoir un score allant de 0 à 1, nous allons utiliser l'importance relative des poids de nos différents KPIs. Pour chaque KPI, nous allons diviser son importance par la somme des importances de l'ensemble de nos KPIs. Le terme l est le nombre de KPIs.

Eq. (12) : $a(KPI) = \frac{Importance(KPI)}{\sum_{k=1}^{l} Importance(KPI(k))}$

Étape 6 : Élaboration d'une méthode de collecte de données

A la fin de l'étape 5, nous disposerons d'une fonction d'agilité. Pour pouvoir utiliser cette fonction pour une entreprise, il est nécessaire de faire évaluer les KPIs par cette entreprise. Le but de l'étape 6 est d'établir une méthode d'évaluation des KPIs à proposer aux entreprises. Nous avons opté pour créer un questionnaire à soumettre aux entreprises. L'avantage d'un questionnaire est de permettre de collecter des données auprès de beaucoup d'individus rapidement (BdVGdC, La tenue d'enquête : Avantages et inconvénients de diverses méthodes de collecte de données auprès d'individus). Afin d'assurer la relevance des réponses aux questionnaires, les entreprises sont invitées à les envoyer à des personnes et à des moments différents. (BdVGdC, La tenue d'enquête : Elaboration et vérification des instruments de collecte de données)

3.3. Application de notre modèle à une entreprise

Pour éprouver notre méthode, nous allons l'appliquer à une entreprise et confronter les résultats obtenus avec l'avis d'un responsable de cette entreprise.

4. Analyse des données et résultats

4.1. Étape 1 : Lister l'ensemble des KPIs issus de la revue de littérature

Les KPIs sont répartis en 7 catégories. Les cinq premières correspondent aux cinq dimensions identifiées lors de l'examen de la littérature. Les deux catégories restantes incluent les KPIs opérationnels et liés aux clients. Chaque KPI est associé à un article qui souligne son rôle clé dans l'agilité d'une entreprise. Pour chaque article, nous avons relevé le nom et les auteurs.
En tout, 50 KPI sont listés. L'annexe 4.1 présente tous les KPIs avec leur dimension respective, ainsi que les titres et les auteurs des articles qui attestent de leur importance dans la mesure de l'agilité. Un exemple de cette annexe est illustré ci-dessous :

Dimension	Description du KPI	Titre	Auteurs
Culture	La compréhension du projet de l'équipe	Perception des méthodes agiles par les développeurs aujourd'hui	Gauthier Florian, Deneckère Rébecca

Tableau 4.1. Tableau reprenant la dimension d'un KPI, son nom et les références de l'article prouvant son importance - exemple

Si l'objectif de ce mémoire a pour but de mesurer l'agilité d'une entreprise, il parait néanmoins utile d'ajouter des KPIs sur la santé globale de l'entreprise afin de les analyser (Laura Bini, 2019). C'est pour cela que trois KPIs seront ajoutés dans notre liste : 1) le chiffre d'affaires, 2) le nombre d'employés, 3) le volumes de clients. Ces KPIs sont également présents dans l'annexe 4.1.

4.2. Étape 2 : Confirmer les KPIs en tant que KPIs valides

Comme précisé plus haut, nous utiliserons 6 critères pour déterminer si un KPI dispose des propriétés nécessaires pour être valide :

- Source : la source de l'information est-elle facilement disponible ou activable ?
- Mesurabilité : est-il aisé de transformer les données sources en données utilisables ?
- Complexité : la mesure est-elle facilement compréhensible ?
- Fiabilité : les données sont-elles fiables ?
- Temporalité : les mesures peuvent-elles être répétées dans le temps ?
- Comparaison : les mesures d'une entreprise peuvent-elles être comparées avec la même mesure au sein d'une autre entreprise ? Existe-t-il une mesure standard de comparaison ?

4.3. Étape 3 : Sélection des articles scientifiques les plus significatifs à partir de ScienceDirect

La base de données de ScienceDirect3 a été questionnée avec quatre recherches différentes : « measure the enterprise agility », « measures the organisation agility », « frameworks to measure the agility » et « agility frameworks ».

Certains articles apparaissent comme réponses à plusieurs questions. Dès lors, le total des articles n'est de 200 articles mais de 123. La liste des 123 articles se trouve en annexe 4.2.

4.4. Étape 4 : Trouver les mots-clés représentatifs des KPIs

Nous avons interrogé Chat-GPT 3.5 pour trouver 50 mots-clés par KPIs. La liste complète des mots par KPI est référencée en annexe 4.3. Le tableau 4.2 représente un exemple de mots clés recherchés pour un KPI de la dimension Culture.

Dimension	KPI	Mots clés
Culture	La compréhension du projet de l'entreprise et de ses valeurs par les employés	"organizational values", "organizational value", "understand the project", "understand the values"

Tableau 4.2. Tableau représentant la dimension du KPI, son nom, et les mots-clés utilisés pour le rechercher dans les articles.

La liste complète des mots est référencée en annexe 4.3.

4.5. Étape 5 : Pondération des KPIs via une analyse du corpus scientifique

Résultats de la recherche de la pondération par occurrence des KPIs

Dans cette première analyse, nous nous basons sur le nombre de d'articles dans lequel un mot clé se retrouve, voir équations (3), (4) et (5).

[3] https://www.sciencedirect.com/

KPIs significatifs

Identification des KPIs significatifs

Nous sélectionnons les KPIs ayant une occurrence relative de minimum 0,01%. **Avec cette méthode, nous avons 45 KPIs significatifs soit 90% des KPIs validés dans les étapes précédentes.**

Ces KPIs sont repris à l'annexe 4.4. Dans cette annexe, nous retrouvons la dimension d'un KPI, le nom du KPI, l'occurrence de celui dans la littérature et son occurrence relative.

L'annexe sera représentée comme ceci :

Dimensions	KPI	Occurrence pdf	Occurrence relative
Technologie	La qualité des processus/logiciels : erreur (bug)	120	5,53%

Tableau 4.3. Tableau représentant la dimension, le nom, le nombre d'articles dans lesquels ses mots-clés apparaissent et cette occurrence relative**.**

Si nous supposions que tous les KPIs ont une influence égale, nous remarquerions que la dimension la plus significative, celle avec le plus grand nombre de KPIs significatifs, est la dimension culturelle (11 KPIs, soit 24,44 %). Ensuite, viendraient les dimensions organisationnelle (10 KPIs, soit 22,22 %), technologique (8 KPIs, soit 17,78 %), personnes (6 KPIs, soit 13,33 %) et de leadership (6 KPIs, soit 13,33 %). La dimension opérationnelle compterait 2 KPIs (4,44 %) tout comme la dimension client (4,44 %). Cette approche nous permettrait d'identifier trois groupes de dimensions : un premier groupe avec des valeurs fortement élevées comprenant les dimensions culturelle, organisationnelle et technologique, un deuxième groupe avec des valeurs moyennes pour les dimensions personnes et leadership, et enfin un dernier groupe avec des valeurs plus faibles englobant les dimensions client et opérationnelle des KPIs.

Les volumes de KPIs significatifs selon l'occurrence sont résumés dans le tableau 4.4.

Étiquettes de l	Nombre de KPI
Culture	11
KPI client	2
KPI opérationnel	2
Leadership	6
Organisation	10
Personnes	6
Technologie	8
Total général	**45**

Tableau 4.4. Tableau montrant le nombre de KPIs significatifs présents dans chacune des dimensions selon la méthode par occurrence.

Analyse des KPIs significatifs pondérés

Comme nous l'avons décrit dans notre méthodologie, nous partons du principe que les KPIs n'ont pas la même influence. Dès lors, nous allons analyser l'occurrence relative des dimensions (équation (5)). Un même article peut reprendre plusieurs KPI d'une même dimension ; dans ce cas, il est compté plusieurs fois. Du coup, les résultats sont modifiés. C'est la dimension technologie dont les KPIs sont présents dans le plus d'articles (311) dans le corpus analysé (31,34%). Dans l'ordre, nous avons ensuite la dimension organisation (24,10%), la dimension culture (14,33%), la dimension leadership (13,46%), la dimension personnes (12,12%), la dimension des KPIs opérationnels (3,09%) et enfin la dimension client (1,57%). Selon cette méthode, nous constatons l'importance de la dimension technologie et de la dimension organisation car elles définissent à elles seules plus de 50% de l'agilité des entreprises. Cela n'est pas étonnant car on retrouve dans la dimension technologie tous les mots clés relatifs aux KPIs processus, méthodologies agiles et technologies de communication. Or, ce sont ces 3 KPIs qui apparaissent en premier dans notre classement. La dimension organisation joue un rôle prédominant. Ce résultat s'explique par l'importance qu'ont les KPIs relatifs à la communication. Enfin, nous constatons que les dimensions ayant les résultats les plus faibles sont les dimensions des KPIs clients et des KPIs opérationnels dans notre modèle. Ces résultats sont résumés dans le tableau 4.5**.**

Dimension	Somme de Occurrence pdf	Somme des occurrences pdf relative
Culture	311	14,33%
KPI client	34	1,57%
KPI opérationnel	67	3,09%
Leadership	292	13,46%
Organisation	523	24,10%
Personnes	263	12,12%
Technologie	680	31,34%
Total général	**2170**	**1**

Tableau 4.5. Tableau montrant le nombre de fois qu'un mot-clé appartenant a été cité dans un article pour chaque dimension ainsi que ce nombre relatif.

KPIs non significatifs

Nous ne retenons pas 9 KPIs car leur occurrence relative est inférieure à 0,01%. La liste des KPIs non significatifs pour la méthode de pondération par occurrence se retrouve en annexe 4.5.

Recherche par la méthode de pondération par fréquence

Dans cette seconde analyse, nous nous basons sur le nombre dans lequel un mot clé se retrouve, voir équations (3), (4) et (5).

KPIs significatifs

Identification des KPIs significatifs

Selon cette méthode, les KPIs sont significatifs si leur fréquence relative est supérieure au 0,01%.

Avec cette méthode, nous avons sélectionné 31 KPIs, soit 62% de nos KPIs. Ce nombre est inférieur à celui obtenu par la méthode de pondération par occurrence (41). L'ensemble des KPIs significatifs selon cette méthode est représenté à l'annexe 4.6 qui a la forme du tableau suivant :

Dimension	KPI	Occurrence mots clés	Nombre pdf	Occurrence*nombre pdf	Occurrence*nombre pdf relatif
Technologie	La qualité des processus/logiciels : erreur (bug)	5870	120	704.400	21,084%

Tableau 4.6. Tableau représentant le nom d'un KPI, sa dimension, l'occurrence totale de ses mots clés, le nombre d'articles total dans lesquels ses mots-clés ont été cités, la multiplication de ces deux critères et son importance relative en fonction de la méthode par fréquence.

C'est la dimension organisation qui possède le plus de KPIs (8 KPIs, 25,81%). Ensuite viennent les dimensions leadership et technologies (6 KPIs, 19,35%), la dimension culture (5 KPIs, 16,13%), la dimension personne (3 KPIs, 9,68%) et enfin viennent les deux dimensions des KPIs clients et des KPIs opérationnels avec la dimension KPI opérationnel (2 KPIs 6,45%) et dimension client (1 KPI, 3,23%). On distingue des groupements comme avec la méthode précédente. Le premier groupe avec des scores élevés comprend la dimension technologie, leadership, organisation et culture. Un deuxième groupe avec des scores bas comprend la dimension personnes, les KPIs opérationnels et les KPIs clients. Ces résultats sont résumés dans le tableau ci-dessus :

Étiquettes de lignes	Nombre de KPI	Nombre de KPI (%)
Culture	5	16,13%
KPI client	1	3,23%
KPI opérationnel	2	6,45%
Leadership	6	19,35%
Organisation	8	25,81%
Technologie	6	19,35%
Personnes	3	9,68%
Total général	**31**	**1**

Tableau 4.7. Tableau reprenant le nombre de KPIs significatifs et ce nombre relatifs selon la méthode par fréquence pour chacune des dimensions.

Analyse des KPIs significatifs pondérés

Il y a très peu de changement au niveau de la fréquence pondérée. En effet, la première dimension reste la technologie et elle a énormément d'importance (78,01%). Le classement des dimensions suivante est l'organisation (11,7%), les personnes (4,46%), la culture (2,91%), le leadership (2,16%), les KPIs opérationnels (0,69%) et les KPIs clients (0,0'%). Nous déterminons 4 grands groupes de KPIs dans nos résultats : un premier groupe avec des résultats très élevés comprenant la technologie, un groupe avec des résultats élevés avec la dimension organisation, un troisième groupe ayant des résultats bas comprenant les dimensions personnes, culture et leadership, et un dernier groupe avec des résultats très bas avec les KPIs opérationnels et les KPIs clients.

Selon cette méthode, nous pouvons constater l'importance énorme de la technologie. Cela ne semble pas incohérent en raison des mêmes explications citées dans la méthode précédente. Enfin, on retrouve les dimensions des KPIs clients et des KPIs opérationnels aux dernières places, signifiant leur importance très faible quant à la définition de l'agilité d'une entreprise. Ces résultats se retrouvent dans le tableau suivant :

Étiquettes de lignes	Somme de occurrence*nombre pdf relatif
Culture	2,91%
KPI client	0,04%
KPI opérationnel	0,69%
Leadership	2,16%
Organisation	11,70%
Technologie	78,01%
Personnes	4,46%
Total général	**99,96%**

Tableau 4.8. Tableau reprenant l'importance des dimensions selon la méthode par fréquence

KPIs non significatifs

Comme pour la précédente méthode, les KPIs non significatifs sont les KPIs pour lesquels leur fréquence relative est inférieur à 0,01%. Les KPIs non-significatifs sont repris dans le tableau à l'annexe 4.7. Cette annexe sera structurée de la manière suivante :

Dimension	KPI	Pondération par fréquence
Culture	La cohésion d'équipe	0,007%

Tableau 4.9. Tableau reprenant les KPIs non significatifs selon la méthode par fréquence ainsi que leur pondération par fréquence.

Résultats de la recherche IDF des KPIs

KPI significatifs

Identification des KPIs significatifs

Nous pouvons voir que seulement 28 KPIs sont significatifs sur 50 soit 56% des KPIs.

L'ensemble des KPIs significatifs selon la méthode TF-IDF est présente à l'annexe 4.8**.** Cette annexe sera structurée comme le tableau suivant :

Dimensions	**KPI**	**Importance IDF**	**Importance relative**
Technologie	La qualité des processus/logiciels : vitesse d'exécution	9,512079568	16,08%

Tableau 4.10. Tableau représentant la dimension, le nom, l'importance IDF et l'importance IDF pour le KPI « La qualité des processus/logiciels : vitesse d'exécution »

Au niveau du nombre de nos KPIs significatifs, notre méthode représente seulement 6 dimensions sur 7. En effet, les KPIs clients semblent non significatifs selon la méthode de pondération par le TF-IDF. Nous voyons une forte influence de la technologie et de l'organisation au détriment des personnes et de la culture : organisation (8 KPIs, 28,57%), technologies (7 KPIs, 25%), leadership (6KPIs, 21,43%), personnes (3 KPIs, 10,71%) et culture (3 KPIs, 10,17%). Nous constatons que seul le KPI « chiffre d'affaires» est significatif parmi la dimension KPIs opérationnels (1 KPI, 3,57%).

Nous constatons deux groupes de dimensions : un premier groupe avec des scores élevés qui comprend la dimension technologie, leadership et organisation, et un deuxième groupe avec des scores bas comprenant la dimensions personnes, culture et les KPIs opérationnels.

Ces résultats sont résumés dans le tableau suivant :

Dimensions	Nombre de KPIs	Nombre de KPIs relatifs
Culture	3	10,71%
KPI opérationnel	1	3,57%
Leadership	6	21,43%
Organisation	8	28,57%
Personnes	3	10,71%
Technologie	7	25,00%
Total général	**28**	**1**

Tableau 4.11. Tableau représentant le nombre de KPIs significatifs selon la méthode TF-IDF, ainsi que sa version relative pour chacune des dimensions.

Analyse des KPIs significatifs pondérés

La tendance retrouvée au niveau du nombre de KPIs significatifs se retrouve également dans les poids de nos différents KPIs. En effet, la dimension technologie a une importance relative de 68,03% et constitue la dimension la plus importante selon notre modèle. Ensuite, la dimension organisation a une importance relative de 18,16%, la dimension culture a une importance relative de 4,51%, la dimension leadership a une importance relative de 4,08%, la dimension personnes a une importance relative de 3,87%. Enfin, notre dimension opérationnelle a une importance relative de 1,34%.

Nous constatons à nouveau 4 groupes de dimensions : un premier groupe avec un score très élevé qui comprend la dimension technologie, un deuxième groupe ayant un score élevé avec la dimension organisation, et un troisième groupe avec des scores bas comprenant la dimension leadership, culture, personnes et un quatrième groupe avec un score très bas contenant seulement la dimension des KPIs opérationnels. La différence en poids entre ces groupes est

bien plus marquée que la différence en nombre de KPIs. Cela s'explique notamment par les poids élevés des KPIs appartenant à la dimension technologie. Selon notre méthode, notre dimension technologie explique à elle seule 68 % de l'agilité de l'entreprise.

Ces résultats se retrouvent dans le tableau suivant :

Étiquettes de lignes	Somme de IDF relatif
Culture	4,51%
KPI opérationnel	1,34%
Leadership	4,08%
Organisation	18,16%
Personnes	3,87%
Technologie	68,03%
Total général	**1**

Tableau 4.12. Tableau représentant l'importance relative de chaque dimension selon la méthode TF-IDF.

L'ensemble des résultats semble cohérent avec ce que nous avons trouvé dans la littérature. En effet, nos 3 meilleurs scores sont respectivement l'importance des processus et logiciels de l'entreprise, la communication au sein de l'entreprise et l'utilisation des méthodologies agiles. **Toutefois, la non-significativité du KPI clients est une différence majeure.**

KPI non significatifs

Un KPI non significatif a une valeur en dessous de 1×10^{-5}, soit moins de 0.01%. L'ensemble de ces KPIs non significatifs est repris à l'annexe 4.9.

Elle aura la même structure que l'annexe 4.5.

Comparaison des résultats des trois méthodes

Nous allons comparer nos résultats en utilisant les critères de comparaison suivants : le nombre relatif des KPIs retenus, l'importance relative de ceux-ci et nous allons comparer 10 premiers KPIs pour chaque méthode.

Nombre des KPIs relatifs et importance relative

Dans le tableau ci-dessous, nous regardons le nombre de KPIs relatifs pour chaque dimension et nous le comparons avec celui venant des autres méthodes. Nous effectuons le même travail pour l'importance relative.

	Nombre de KPIs relatifs			Importance relative		
Méthode :	Occurrence	fréquence	TF - IDF	Occurrence	fréquence	TF - IDF
Culture	24,44%	16,13%	10,71%	14,33%	2,91%	4,51%
KPI clients	4,44%	3,23%	0,00%	1,57%	0,04%	0,00%
KPI opérationnel	4,44%	6,45%	3,57%	3,09%	0,69%	1,34%
Leadership	13,33%	19,35%	21,43%	13,46%	2,16%	4,08%
Organisation	22,22%	25,81%	28,57%	24,10%	11,70%	18,16%
Personnes	13,33%	9,68%	10,71%	12,12%	4,46%	3,87%
Technologies	17,78%	19,35%	25,00%	31,34%	78,01%	68,03%

Tableau 4.13. Tableau comparatif des 3 méthodes utilisées par rapport au nombre relatif de KPIs significatifs et l'importance relative de chacune des dimensions.

D'abord et avant tout, il est clair que la technologie joue un rôle majeur, quelle que soit la méthode employée. On retrouve également plus ou moins la même importance pour l'organisation. Les 3 autres dimensions relatives à l'agilité restent également plus ou moins dans les mêmes valeurs peu importe la méthode utilisée. Les deux dimensions rajoutées ont toujours les deux dernières places, ce qui signifie que leur importance est très mince pour la définition de l'agilité selon notre modèle.
Que cela soit pour le nombre de KPIs relatifs ou pour l'importance relative, le classement des dimensions change très peu.

Nous pouvons constater que la méthode TF-IDF est cohérente car elle obtient plus ou moins les mêmes tendances que les autres méthodes. Elle se distingue toutefois des autres méthodes en apportant des modifications dans les poids relatifs des KPI et en supprimant les KPI de la dimensions clients comme KPIs significatifs de l'agilité. C'est pourquoi, cette dernière méthode sera retenue pour calculer la pondération des KPIs par la suite sur base d'un questionnaire.

Classements des 10 premiers KPIs pour chaque méthode.

Voici le tableau 4.14 reprenant les 10 KPIs les plus importants pour chaque méthode

Occurrence	Fréquence	TF - IDF
La qualité des processus/logiciels : erreur (bug)	La qualité des processus/logiciels : erreur (bug)	La qualité des processus/logiciels : erreur (bug)
Amélioration des logiciels : fréquence	Amélioration des logiciels : fréquence	Amélioration des logiciels : fréquence
Amélioration des logiciels : utilité	Amélioration des logiciels : utilité	Amélioration des logiciels : utilité
La qualité des processus/logiciels : vitesse d'exécution	La qualité des processus/logiciels : vitesse d'exécution	La qualité des processus/logiciels : vitesse d'exécution
L'utilisation des méthodologie agile reconnue comme Kanban/Scrum/Scrumban.	L'utilisation des méthodologie agile reconnue comme Kanban/Scrum/Scrumban.	La facilité de communication sur le lieu de travail

Les formations	Les formations	La facilité de communication avec l'équipe
La facilité de communication sur le lieu de travail	La facilité de communication sur le lieu de travail	La facilité de communication avec les managers, ainsi que la confiance envers ceux-ci
La facilité de communication avec l'équipe	La facilité de communication avec l'équipe	La facilité de communication avec une équipe différente
La facilité de communication avec les managers, ainsi que la confiance envers ceux-ci	La facilité de communication avec les managers, ainsi que la confiance envers ceux-ci	L'utilisation des méthodologie agile reconnue comme Kanban/Scrum/Scrumban.
La facilité de communication avec une équipe différente	La facilité de communication avec une équipe différente	La fréquence de réunions

Tableau 4.14. Tableau représentant les 10 meilleurs KPIs selon les 3 méthodes

Sur l'ensemble des 30 KPI repris dans le tableau, il n'y en a en fait que 11 KPIs différents. Cela signifie que les KPIs les plus importants restent les mêmes, quelle que soit la méthode.
On retrouve les KPIs liés aux processus, les KPIs liés à la communication et le KPI concernant les méthodologies agiles. Ces KPIs appartiennent uniquement aux dimensions technologies et organisation. Cela explique l'importance forte de ces dimensions dans les différentes méthodes comme nous l'avons expliqué plus tôt.

4.6. Étape 6 : Élaboration d'une méthode de collecte de données

Pour définir les questions permettant aux entreprises d'évaluer leurs KPI, nous nous sommes basés sur deux questionnaires élaborés dans cet objectif. Il s'agit du questionnaire de Wendler et du questionnaire de Gunsberg. et Al. (David Gunsberg, 2018). Sur base des KPIs retenus, nous avons pu établir une liste des questions.
L'ensemble des questions se retrouvent à l'annexe 4.10. Elle possède la structure du tableau ci-dessous :

Dimension	**Key Performance Indicators**	**Questions**
Culture	L'envie de travailler pour l'entreprise	De 0 à 5, êtes-vous motivé à travailler pour l'entreprise ?

Tableau 4.15. Tableau représentant les questions posées pour chacun des KPIs.

4.7. Utilisation de notre questionnaire et de notre évaluation des KPIs au sein d'une entreprise.

Information sur l'entreprise test

Le groupe Solidaris emploie plus de 5.250 collaborateurs en Belgique. Solidaris gère pour le compte de l'État l'Assurance Maladie-Invalidité Obligatoire. Elle est la mutualité leader en Wallonie avec 1.356.000 affiliés. Le groupe est actif en tant qu'organisme assureur, mais aussi en tant que société mutualiste d'assurance (SMA) et dispose d'un réseau socio-culturel et socio-sanitaire étendu sur toute la Wallonie.

Disponibilité des données

Pour disposer de réponses fiables à notre questionnaire, nous avons contacté le directeur des projets digitaux. Solidaris dispose d'un service d'études et d'un service marketing qui réalisent régulièrement des enquêtes auprès de employés en interne (Enquête Information & Communication, Enquête mieux-être) et envers leurs affiliés (baromètre mensuel de satisfaction client). Pour des raisons de confidentialité, ces données ne peuvent pas être communiquées en tant que telles. Cependant, le directeur des projets digitaux s'est proposé d'utiliser ces données afin de pouvoir répondre aux questions. Le directeur des projets digitaux a fourni les réponses aux questions. Elles ne sont pas des réponses personnelles mais ont été données sur la base des différentes enquêtes existantes au sein de Solidaris. Toutefois, lorsqu'une question ne pouvait pas être répondue sur base des enquêtes existantes chez Solidaris, une évaluation personnelle a été donnée par le directeur des projets digitaux, celui-ci essayant le plus possible de représenter un avis commun avec ses collègues.

Réponses et résultats du questionnaire

Le questionnaire et ses réponses sont mis à l'annexe 4.11. Un graphe radar a également été mis à l'annexe 4.12. L'interview complète se trouve à l'annexe 4.13.

Scores Solidaris par dimension sans pondération

Nous reprenons ici le classement des dimensions par importance sur la base des réponses de Solidaris, si tous les KPIs avaient la même influence. Les dimensions personnes, organisation et leadership ressortent en tête du classement.

Étiquettes de lignes	Somme de Réponse	Max possible	% Max
Culture	8	15	53%
KPI opérationnel	3	5	60%
Leadership	33	45	73%
Organisation	64	85	75%
Technologie	27	50	54%
Personnes2	27	35	77%
Total général	**162**	**235**	**69%**

Tableau 4.16. Tableau représentant le score global d'agilité sans pondération de l'entreprise Solidaris.

Le niveau d'agilité évalué sans pondération est de 69%.

Score Solidaris selon la fonction d'agilité pondéré

Nous reprenons ici le classement des dimensions par importance, selon la fonction d'agilité pondérée. Les dimensions technologies et organisation ressortent en tête du classement.

Dimensions	Score questionnaire	Score questionnaire	Importance relative
Technologie	27	36,17%	62,49%
Organisation	64	13,74%	23,73%
Personnes	27	2,87%	4,97%
Leadership	33	2,52%	4,36%
Culture	8	1,78%	3,07%
KPI opérationnel	3	0,80%	1,39%
KPI clients	0	0,00%	0,00%
		57,88%	100,00%

Tableau 4.17. Tableau représentant le score global d'agilité avec pondération de l'entreprise Solidaris.

Le niveau d'agilité évalué avec pondération est de 58%.

Appréciation du résultat par le directeur des projets digitaux

Pour le directeur des projets digitaux, un score d'agilité de 58% pourrait suggérer que Solidaris se situe à un niveau modèré en termes d'agilité d'entreprise. Cela signifie que certaines pratiques agiles sont mises en œuvre, mais qu'il y a encore des domaines qui pourraient être améliorés pour atteindre un niveau plus élevé d'agilité.

En analysant les résultats détaillés du test par dimension, il apparaît que la technologie joue un rôle crucial dans le score pondéré, ce qui explique pourquoi il y a une différence entre les 69% observés, sur la base des réponses brutes et les 58% calculés avec les pondérations. Ceci est d'autant plus marquant que chez Solidaris, la dimension technologique (avec la dimension culture) est celle qui est la moins avancée par rapport au maximum possible. Ce ne semble pas étonnant pour le directeur des projets digitaux, et il déclare que cette information est corroborée par les différentes enquêtes internes. Les enquêtes internes montrent également que la dimension people est la plus avancée, le personnel de Solidaris étant fortement formé et diversifié.

Nos résultats coïncident également avec les dimensions fortement représentées chez Solidaris. Le directeur le confirme : « *Je ne suis pas étonné des scores de 77% de la dimension Personnes et 73% pour le Leadership ».*

Néanmoins, le directeur souligne son étonnement pour la dimension organisation car elle ne reflète pas les résultats recueillis par les questionnaires internes de l'entreprise.

Enfin, pour le directeur, la dimension KPIs opérationnels n'a pas beaucoup de sens pour une mutualité car ce n'est pas une entreprise commerciale mais plutôt un service public.

Enseignements retirés de l'exercice

Pour le directeur des projets digitaux, en fonction des domaines identifiés, des mesures correctives spécifiques peuvent être prises pour améliorer le niveau d'agilité. Des actions sont déjà prises au niveau des technologies, un plan de transformation digitale a d'ailleurs été élaboré.

Vu son importance dans l'agilité de l'entreprise, les initiatives visant à renforcer l'organisation interne comme la mise en place de cadres de gestion de projet agiles tels que Scrum ou Kanban, la création d'équipes multidisciplinaires auto-organisées, et la promotion du processus d'amélioration continue sont à encourager.

Enfin, vu la faiblesse de la dimension culture, des actions pourraient être envisagées pour favoriser la collaboration et la communication ouverte entre équipes ou pour encourager la prise de risque et l'innovation.

Partage d'expérience sur l'exercice

Pour le directeur des projets digitaux, l'exercice fut enrichissant.

« L'agilité d'entreprise est complexe, elle est un élément clé de la transformation numérique. En tant que directeur des projets digitaux, mon rôle consiste à conduire Solidaris à travers sa transformation numérique en adoptant des technologies et des processus modernes. Les initiatives de transformation numérique nécessitent souvent un changement culturel et organisationnel. L'agilité peut aider à faciliter ce changement en encourageant la flexibilité, la prise de responsabilité et l'ouverture au changement au sein de l'entreprise. »

5. Discussion

5.1. La méthode TF-IDF convient-elle ?

Utiliser la méthode TF-IDF pour évaluer l'importance d'un KPI sur la base d'un corpus scientifique est tout à fait faisable. En outre, la méthode nous a permis d'obtenir des résultats qui sont cohérents avec les autres méthodes mais toutefois avec des différences.

5.2. Nos résultats sont-ils comparables avec l'article de référence de Wendler ?

Nous avons rassemblé les différents KPIs sélectionnés par Wendler dans son article de 2013 et nous les avons insérés dans nos dimensions. Pour chaque dimension, nous avons calculé son occurrence relative. Dans le tableau ci-dessous, le colonne « somme des occurrences relatives » correspond au pourcentage d'apparition des différents KPIs d'une dimension dans les textes sélectionnés de Wendler.

Étiquettes de lignes	Somme des occurrences relatives selon Wendler	Somme des occurrences relatives selon notre méthode
KPI Client	5,24%	1,57%
Culture	21,47%	14,33%
Leadership	3,66%	13,46%
KPI Opérationnel	5,24%	3,09%
Organisation	3,14%	24,10%
Personnes	32,46%	12,12%
Technologie	28,80%	31,34%
Total général	**1**	**1**

Tableau 5.1. Tableau comparatif de nos résultats avec la méthode TF-IDF et les résultats de Wendler.

Selon nos méthodes, les dimensions KPI clients, culture, KPI opérationnel et personnes ont moins d'importance que selon la méthode de Wendler. Nous remarquons toutefois que les approches confirment une importance forte de la technologie. La plus grande différence se retrouve pour la dimension organisation. Comme nous l'avions vu précédemment, l'importance de cette dimension selon notre méthode est due à l'importance portée à la communication et au lieu de travail. Dans la méthode de Wendler, la communication n'est pas explicitement mentionnée et se retrouve un peu dans toutes les dimensions. Wendler accorde également aucune importance au lieu de travail.

5.3. Comment expliquer les différences entre Wendler et nos résultats ?

Nous utilisons une méthode plus performante que Wendler. Notre méthode est la méthode TF-IDF et elle est largement réputée pour ces résultats pour la recherche d'information dans un texte malgré le fait que peu de recherches prouvent que l'importance d'un mot soit trouvée par ses apparitions dans un ensemble d'articles.

De plus, nous avons utilisé plus de textes (123 dans notre approche par rapport à 28 pour Wendler) et nous les avons sélectionnés de manière robuste, en questionnant un site reconnu de littérature scientifique et en faisant confiance à son algorithme de relevance. En outre, l'analyse de Wendler a été réalisée en 2013. Or, de nouveaux articles sont apparus dans la littérature depuis. Enfin, la méthode de recherche de Wendler dans la littérature scientifique diffère de la nôtre car Wendler a recherché des articles spécifiques à certains KPIs en utilisant le nom du KPI comme mot-clé tandis que nous avons cherché des articles en questionnant ScienceDirect de manière plus globale sur les différentes mesures de l'agilité des entreprises.

5.4. Ce mémoire remplit-il ces objectifs ?

Pour rappel, l'objectif de ce mémoire était, d'une part, de trouver les différents KPIs permettant de mesurer l'agilité d'une entreprise et, d'autre part, de proposer une méthode pour évaluer un score d'agilité au sein d'une entreprise. Ce mémoire répond correctement à ces deux objectifs. Nous avons élaboré une équation de l'agilité dont les termes sont les KPIs sélectionnés pour définir l'agilité et dont les poids de ces termes sont induits de leurs importances dans la littérature selon la méthode TF-IDF.

6. Conclusion

L'objectif de ce mémoire était d'identifier les Indicateurs Clés de Performance (KPI) pour évaluer l'agilité d'une entreprise. Pour y parvenir, notre démarche a débuté par une revue de la littérature scientifique existante afin d'enrichir notre compréhension du sujet. Ensuite, nous avons élaboré notre méthodologie de recherche. Malgré l'existence de méthodes établies pour mesurer l'agilité, nous avons jugé nécessaire d'adopter une approche innovante, en reconnaissant que différents KPI exercent des influences d'intensité variable sur les scores d'agilité, en fonction de la pertinence de termes spécifiques au sein de la littérature scientifique. Nous avons évalué cette pertinence en utilisant la méthode TF-IDF, largement reconnue comme optimale pour l'analyse de texte. Notre présentation des résultats a mis en évidence l'impact substantiel de la technologie et des aspects organisationnels sur l'agilité. Par la suite, nous avons sollicité le directeur de la digitalisation d'une entreprise de soins de santé (Solidaris) pour répondre à des questionnaires visant à quantifier l'agilité de sa société. Les résultats obtenus pour cette entreprise concordaient avec les perspectives internes des directeurs chez Solidaris, soulignant ainsi l'efficacité de notre méthodologie. Enfin, notre mémoire a exploré des améliorations à notre modèle, suggérant des perfectionnements à la méthode TF-IDF et proposant une comparaison de notre modèle avec les méthodes existantes de mesure de l'agilité.

Nous avons confirmé un élément intéressant lors de notre réflexion : notre approche confirme que certains KPIs ont plus de poids que d'autres. Ainsi, il devient possible de hiérarchiser ces KPIs en fonction de leur importance. Avoir une classification des KPIs peut s'avérer précieux, notamment pour les entreprises en pleine transformation agile. En priorisant l'amélioration des KPIs exerçant une influence majeure, l'entreprise aura davantage de chance d'accroître son agilité.

Enfin, relevons quelques pistes d'amélioration. Nos résultats sont basés sur une quantité limitée d'articles scientifiques. Une puissance de calcul accrue pourrait améliorer les résultats. Ajouter du contexte à l''algorithme de sélection et de classement de ScienceDirect renforcerait la pertinence des mots clés sélectionnés. Une version perfectionnée de TF-IDF pourrait améliorer les résultats. L'approche uniforme des poids des KPIs peut être améliorée en tenant compte du secteur ou des départements de l'entreprise. Enfin, nos mesures profiteraient d'une validation complémentaire en la comparant avec d'autres mesures d'agilité telles que le Quotient Agile ou le Agile Health Radar.

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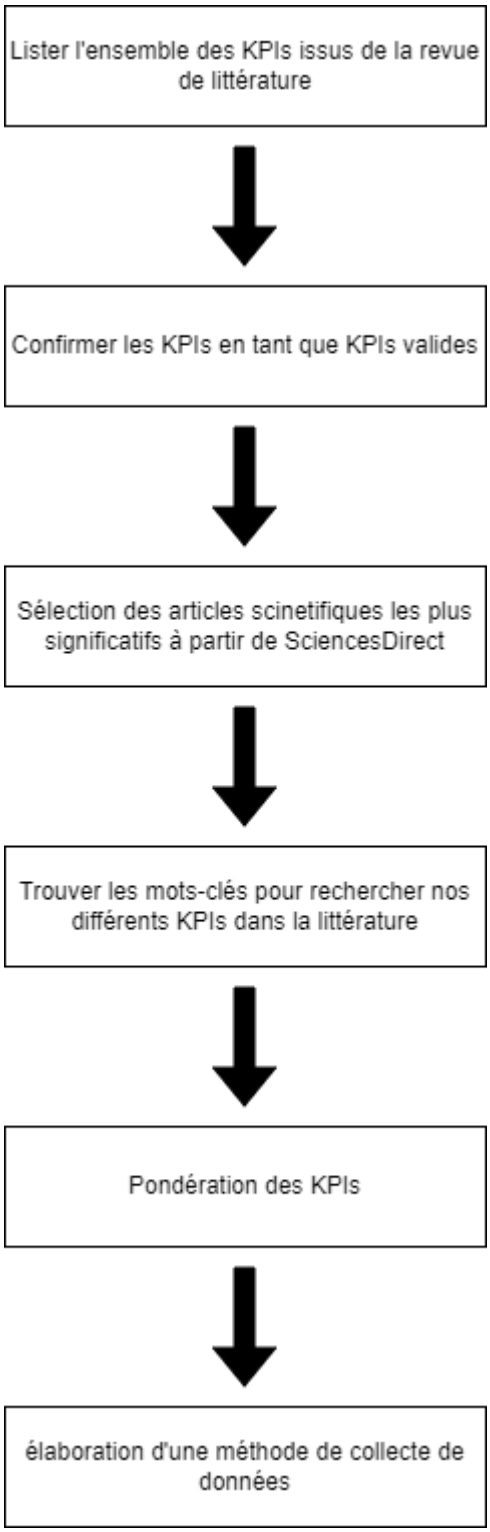
Annexes

Annexe 3.1. Étapes de notre méthodologie



Cette annexe comprend le nom et l'ordre d'exécution des 6 étapes utilisées dans notre méthodologie.

Annexe 3.2. Code Python

Ce code permet de trouver les données nécessaires pour la réalisation des 3 méthodes différentes avec les articles sélectionnés de l'annexe 4.2.

```
#%%

pip install PyMuPDF PyPDF2 nltk scikit-learn

#%%

##Permet d'avoir le nombre d'occurence par section
import os
import PyPDF2
from collections import defaultdict

# Fonction pour extraire le texte d'un fichier PDF
def extract_text_from_pdf(file_path):
    with open(file_path, 'rb') as file:
        pdf_reader = PyPDF2.PdfReader(file)
        text = ''
        for page in pdf_reader.pages:
            text += page.extract_text()
        return text

# Chemin du dossier contenant les fichiers PDF
pdf_folder = "C:\\Users\\Thoma\\OneDrive\\Bureau\\Lecture pour mémoire def"

# Ensembles de mots-clés pour les KPIs
section_words = {
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"corporate ethos", "value interpretation", "cultural identity", "employee
value perception", "values adoption", "value congruence", "cultural
connection", "shared values understanding", "values-based behavior",
"employee value assimilation", "cultural congruence", "values
assimilation", "employee cultural alignment", "cultural identification",
"employee values awareness", "value orientation", "cultural fit", "employee
values integration", "value assimilation assessment", "values
appreciation", "employee value alignment", "value congruence assessment",
"cultural alignment measurement", "employee values interpretation",
"cultural adaptation", "values perception", "cultural understanding",
"value congruence assessment", "employee cultural awareness", "value
assimilation process", "cultural alignment strategies", "employee value
assimilation", "value assimilation measurement", "cultural value
perception", "values education and training","organizational values",
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hierarchy", "organizational structure", "position awareness", "job
responsibilities", "reporting lines", "role definition", "job title
understanding", "departmental alignment", "position description", "team
dynamics", "role expectations", "hierarchical knowledge", "functional
hierarchy", "role perception", "job function clarity", "team roles",
```

```
"reporting hierarchy", "team contribution", "role awareness", "department
relationships", "role visibility", "organizational chart", "functional
responsibilities", "role accountability", "team collaboration", "role
communication", "cross-functional awareness", "role significance", "role
differentiation", "team structure", "role alignment", "position context",
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cooperation", "role differentiation", "hierarchical understanding",
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synergy", "position relevance", "role collaboration", "team
cohesion","understanding of the employee's role within the company",
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the firm", "employee's position awareness within the organization",
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vision", "team alignment", "task coordination", "project mission", "team
dynamics", "task distribution", "project strategy", "team roles", "task
interdependence", "project plan", "team collaboration", "task delegation",
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progress", "team synchronization", "task accountability", "project
milestones", "team cooperation", "task visibility", "project timeline",
"team interactivity", "task engagement", "project deliverables", "team
synergy", "task completion", "project evaluation", "team cohesion", "task
accomplishment", "project assessment", "team harmony", "task efficiency",
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success", "team coordination", "task contribution", "project outcome",
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efficiency", "task realization", "project results","team project",  "teams
projects", "project understanding", "team project understanding", ],

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satisfaction", "career aspirations", "employee engagement", "company
appeal", "job fulfillment", "professional desire", "work interest",
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prospects", "employee dedication", "company culture fit", "job
contentment", "professional ambition", "workplace allure", "employee
loyalty", "company values alignment", "job passion", "career growth",
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vision alignment", "job contentment", "career motivation", "employee
satisfaction", "company purpose alignment", "job engagement", "career
dedication", "employee intent", "company identity fit", "job motivation",
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alignment", "job happiness", "career satisfaction", "employee eagerness",
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aspiration", "company principles alignment", "job dedication", "career
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dedication", "staff retention strategies", "workplace retention
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retention programs", "staff engagement", "workplace engagement", "workforce
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understanding approaches", "collective solidarity initiatives", "group
bonding exercises", "team-building workshops", "mutual respect guidelines",
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clarification", "job understanding", "work responsibilities knowledge",
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understanding", "work responsibilities breakdown comprehension", "task
workload understanding", "duties workload awareness", "task complexity
recognition", "job duties and tasks knowledge", "work tasks and
responsibilities comprehension", "task intricacies understanding", "duties
components recognition", "task functions comprehension","work
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knowledge", "skillset expertise grasp", "expertise proficiency
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recognition", "skillset proficiency awareness", "expertise competency
knowledge", "proficiency skill grasp", "competency capability
understanding", "skill competency comprehension", "capability proficiency
recognition", "skillset competency grasp", "expertise proficiency
comprehension", "proficiency competency recognition", "competency
proficiency familiarity", "skill capability understanding", "capability
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proficiency grasp", "proficiency competency familiarity", "competency
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comprehension", "skill capability recognition", "capability proficiency
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knowledge", "proficiency skill comprehension","skills improvement", "skill
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analysis", "discussion frequency changes", "meetup cadence variations",
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schedule adjustments", "meeting frequency optimization", "gathering
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regularity improvement", "meetup cadence enhancement", "convening rate
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improvement", "meeting frequency trends", "gathering regularity patterns",
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occurrence evaluation", "assemblage frequency assessment", "discussion
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score", "consumer approval measurement", "customer delight feedback",
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fulfillment scale", "client happiness index", "consumer satisfaction
level", "customer approval rating", "client delight score", "consumer
gratification measurement", "customer contentment index", "client
fulfillment score", "consumer happiness rating", "customer satisfaction
assessment", "client pleasure evaluation", "consumer approval analysis",
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contentment scale", "client fulfillment index", "consumer happiness index",
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index", "customer delight scale", "client gratification rating", "consumer
contentment rating", "customer fulfillment rating", "client happiness
evaluation", "consumer satisfaction assessment", "customer approval
evaluation", "client delight analysis", "consumer gratification
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satisfaction", "customers satisfactions"],

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manpower patterns", "staff headcount evaluation", "employee population
assessment", "personnel size evaluation", "team members count measurement",
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headcount evaluation", "employee population assessment", "personnel size
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manpower reduction", "staff headcount optimization", "employee population
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population downsizing methods", "personnel size reduction strategies",
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reduction strategies","number of employees", "employee count", "workforce
size", "staff strength", "total employees"],

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volume patterns", "client quantity evaluation", "consumer volume
assessment", "customer numbers measurement", "client volume measurement",
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"communication with supervisors confidence improvement", "supervisors
communication reliability improvement", "trust in communication with
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"communication with managers assurance enhancement"],

"communication_ease_team ": ["communication within the team simplicity",
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"communication fluency within the team", "communication ease within the
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manager","communicates with the managers","communicates with the
leader","communicates with the leaders", "team communication","teams
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team optimization", "team communication comfort optimization",
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within the team enhancement", "team communication fluency enhancement",
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"communication_ease_different_team ": ["communication with different team
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different team improvement", "different team communication simplicity
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other teams enhancement", "different team communication comfort
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"communication accessibility with another team enhancement", "different
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other teams enhancement"],

"team_diversification ": ["team diversity", "diversity of team members",
"team composition variety", "diversified team makeup", "team member
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"team member diversification", "team composition diversity", "diversified
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composition diversity enhancement", "diversified team structure
enhancement", "team member variety enhancement","diversity", "variety",
"diverseness", "multiformity", "multiplicity", "diversified"],

"position_diversification ": ["company position diversity", "diversity of
roles in the company", "position variety within the company", "diversified
company job roles", "role heterogeneity in the company", "diversity within
company positions", "variety of job roles in the company", "job role
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company", "diversified company role structure", "job role variety within
the company", "company position diversity analysis", "diversity of roles in
the company analysis", "position variety within the company analysis",
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analysis", "diversified company role structure analysis", "job role variety
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"software_understanding_ability ": ["employee software comprehension",
"employee software proficiency", "employee software grasp", "software
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enhancement", "software proficiency of staff enhancement", "software
competency among employees enhancement", "software familiarity among
employees enhancement", "employee software aptitude enhancement", "software
skill of employees enhancement","technologies tools","technology tools","IT
tools","technologies tool","technology tool","IT tool"],

"tools_understanding_ability ": ["technologies tools","technology
tools","IT tools","technologies tool","technology tool","IT tool","employee
tools comprehension", "employee hardware proficiency", "employee tools
grasp", "hardware understanding by employees", "employee hardware
literacy", "hardware proficiency of staff", "hardware competency among
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"work_flexibility ": ["company work flexibility", "workplace flexibility
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enhancement", "workplace flexibility options enhancement", "flexible work
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company enhancement", "company work adaptability enhancement", "workplace
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arrangements", "work flexibility", "job flexibilities", "flexible work
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"schedule_flexibility ": ["company schedule flexibility", "scheduling
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"employee_motivation ": ["employee job motivation", "employee work
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commitment analysis", "employee work dedication analysis", "employee job
engagement analysis", "employee job enthusiasm analysis", "employee work
drive analysis", "employee job motivation optimization", "employee work
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enthusiasm optimization", "employee work drive optimization", "employee job
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improvement", "employee work dedication improvement", "employee job
engagement improvement", "employee job enthusiasm improvement", "employee
work drive improvement", "employee job motivation enhancement", "employee
work encouragement enhancement", "employee job performance motivation
enhancement", "job well-done motivation for employees enhancement",
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enthusiasm enhancement", "employee work drive enhancement","good work",
"good works", "quality of work","motivation of employees to do their job
well", "employee motivation for good performance", "employees drive for
high-quality work", "employee dedication to perform well", "employees
commitment to excellence"],

"employee_training ": ["employee's training", "staff training", "training
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"employee_error_rate ": ["employee error rate", "staff mistake frequency",
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employees optimization", "employee error improvement", "staff mistake
frequency improvement", "error rate among employees improvement", "employee
error enhancement", "staff mistake frequency enhancement", "error rate
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employees", "mistake percentage of employees", "employees accuracy rate",
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"new_technologies_use ": ["use of new technologies by customers",
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technologies utilization by clients", "customer technology usage", "new
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by clients optimization", "customer technology usage optimization", "new
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utilization by clients improvement", "customer technology usage
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technologies utilization by clients enhancement", "customer technology
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"process_quality_speed ": ["quality of processes","quality of
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processes/software", "process/software execution velocity",
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speed of processes/software analysis", "process/software execution velocity
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of execution improvement", "process/software speed quality improvement",
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"process/software speed quality enhancement", "execution speed of
processes/software enhancement", "process/software execution velocity
enhancement"],

"process_quality_error ": ["process/software quality: error (bug)",
"software/process error quality", "bug rate in processes/software",
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enhancement","improve process", "improve processes", "improving process",
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improvings", "software update", "software updates", "softwares update",
"softwares updates"],

"software_improvement_usefulness ": ["software improvement: usefulness",
"software enhancement value", "usefulness of software upgrades", "software
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utility enhancement enhancement"],

"software_improvement_frequency ": ["software improvement: frequency",
"software enhancement regularity", "frequency of software upgrades",
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software upgrades analysis", "software improvement frequency optimization",
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enhancement", "software enhancement regularity enhancement", "frequency of
software upgrades enhancement"],

"agile_methodology_use ": ["use of agile methodology recognized as Kanban /
Scrum / Scrumban.", "Kanban / Scrum / Scrumban usage", "utilization of
recognized agile methodologies", "use of agile frameworks", "agile
methodology use analysis", "use of agile methodology recognized as Kanban /
Scrum / Scrumban. analysis", "Kanban / Scrum / Scrumban usage analysis",
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frameworks analysis", "agile methodology use optimization", "use of agile
methodology recognized as Kanban / Scrum / Scrumban. optimization", "Kanban
/ Scrum / Scrumban usage optimization", "utilization of recognized agile
methodologies optimization", "use of agile frameworks optimization", "agile
methodology use improvement", "use of agile methodology recognized as
Kanban / Scrum / Scrumban. improvement", "Kanban / Scrum / Scrumban usage
improvement", "utilization of recognized agile methodologies improvement",
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"use of agile methodology recognized as Kanban / Scrum / Scrumban.
enhancement", "Kanban / Scrum / Scrumban usage enhancement", "kanban",
"scrum", "scrumban", "utilization of recognized agile methodologies
enhancement", "use of agile frameworks enhancement"],

"it_project_delay ": ["delay rate","lateness", "time delay", "delayed
completion", "postponement","delay of IT projects", "IT project
postponement", "project delay analysis", "delay of IT projects analysis",
"IT project postponement analysis", "project delay optimization", "delay of
IT projects optimization", "IT project postponement optimization", "project
delay improvement", "delay of IT projects improvement", "IT project
postponement improvement", "project delay enhancement", "delay of IT
projects enhancement", "IT project postponement enhancement"],

"communication_technologies_use ": ["use of communication technologies",
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"technology for communication", "communication technologies use analysis",
"use of communication technologies analysis", "communication tools
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for communication analysis", "communication technologies use optimization",
"use of communication technologies optimization", "communication tools
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use improvement", "use of communication technologies improvement",
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improvement", "technology for communication improvement", "communication
technologies use enhancement", "use of communication technologies
enhancement", "communication tools utilization enhancement", "communication
methods usage enhancement", "technology for communication
enhancement","technology adoption by customers", "customer technology
usage", "client use of new technologies", "customer adoption of new tech",
"client technology utilization"]
}

# Dictionnaire pour stocker le nombre total d'occurrences par section
section_occurrences = defaultdict(int)

# Parcours des fichiers PDF dans le dossier
for filename in os.listdir(pdf_folder):
    if filename.endswith('.pdf'):
        pdf_file = os.path.join(pdf_folder, filename)
        pdf_text = extract_text_from_pdf(pdf_file)
        for section, words_in_section in section_words.items():
            word_occurrences = sum(pdf_text.lower().count(word.lower()) for
word in words_in_section)
            section_occurrences[section] += word_occurrences

# Affichage du résultat
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```
print("Nombre total d'occurrences par section:")
for section, occurrences in section_occurrences.items():
    print(f"{section}: {occurrences}")



#%%

import os
import pandas as pd
import fitz  # Bibliothèque PyMuPDF
from collections import defaultdict

# Chemin vers le dossier contenant les fichiers PDF
pdf_folder = "C:\\Users\\Thoma\\OneDrive\\Bureau\\Lecture pour mémoire def"

# Dictionnaire de mots-clés par section
keywords_per_section = {
        "understanding_company_values ": ["employee perception",
"organizational values", "company culture", "values interpretation",
"employee engagement", "core values understanding", "value alignment",
"employee awareness", "cultural assimilation", "value integration",
"employee belief system", "value comprehension", "values communication",
"corporate ethos", "value interpretation", "cultural identity", "employee
value perception", "values adoption", "value congruence", "cultural
connection", "shared values understanding", "values-based behavior",
"employee value assimilation", "cultural congruence", "values
assimilation", "employee cultural alignment", "cultural identification",
"employee values awareness", "value orientation", "cultural fit", "employee
values integration", "value assimilation assessment", "values
appreciation", "employee value alignment", "value congruence assessment",
"cultural alignment measurement", "employee values interpretation",
"cultural adaptation", "values perception", "cultural understanding",
"value congruence assessment", "employee cultural awareness", "value
assimilation process", "cultural alignment strategies", "employee value
assimilation", "value assimilation measurement", "cultural value
perception", "values education and training","organizational values",
"organizational value", "understand the project", "understand the values"],

"understanding_employee_position ": ["job role clarity", "employee
hierarchy", "organizational structure", "position awareness", "job
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company enhancement", "company work adaptability enhancement", "workplace
flexibility offerings enhancement","job flexibility", "flexible work
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"schedule_flexibility ": ["company schedule flexibility", "scheduling
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company optimization", "schedule adaptability in company improvement",
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"flexible scheduling options by company enhancement", "work schedule
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"employee_motivation ": ["employee job motivation", "employee work
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engagement analysis", "employee job enthusiasm analysis", "employee work
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encouragement optimization", "employee job performance motivation
optimization", "job well-done motivation for employees optimization",
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well", "employee motivation for good performance", "employees drive for
high-quality work", "employee dedication to perform well", "employees
commitment to excellence"],

"employee_training ": ["employee's training", "staff training", "training
for employees", "employee skill development", "staff skill enhancement",
"skill improvement for employees", "employee knowledge enhancement", "staff
learning initiatives", "learning opportunities for employees", "employee
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enhancement", "staff learning initiatives enhancement", "learning
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sessions","educational session", "learning programs"],

"employee_error_rate ": ["employee error rate", "staff mistake frequency",
"error rate among employees", "employee error analysis", "staff mistake
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optimization", "staff mistake frequency optimization", "error rate among
employees optimization", "employee error improvement", "staff mistake
frequency improvement", "error rate among employees improvement", "employee
error enhancement", "staff mistake frequency enhancement", "error rate
among employees enhancement","employees error rate", "error rate of
employees", "mistake percentage of employees", "employees accuracy rate",
"error occurrence among employees"],

"new_technologies_use ": ["use of new technologies by customers",
"customers adopting new technologies", "customer technology adoption", "new
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by clients optimization", "customer technology usage optimization", "new
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utilization by clients improvement", "customer technology usage
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usage enhancement","quality of processes","quality of process","processes
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software", "quality of the processes", "quality of the process"],

"process_quality_speed ": ["quality of processes","quality of
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of the process", "process","processes","quality of processes/software:
speed of execution", "process/software speed quality", "execution speed of
processes/software", "process/software execution velocity",
"process/software speed analysis", "quality of processes/software: speed of
execution analysis", "process/software speed quality analysis", "execution
speed of processes/software analysis", "process/software execution velocity
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of execution improvement", "process/software speed quality improvement",
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"process/software speed quality enhancement", "execution speed of
processes/software enhancement", "process/software execution velocity
enhancement"],

"process_quality_error ": ["process/software quality: error (bug)",
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"process/software error analysis", "process/software quality: error (bug)
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processes/software analysis", "process/software error optimization",
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(bug) improvement", "software/process error quality improvement", "bug rate
in processes/software improvement", "process/software error enhancement",
"process/software quality: error (bug) enhancement", "software/process
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enhancement","improve process", "improve processes", "improving process",
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software", "improves softwares", "software improving", "software
improvings", "software update", "software updates", "softwares update",
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"softwares updates"],

"software_improvement_usefulness ": ["software improvement: usefulness",
"software enhancement value", "usefulness of software upgrades", "software
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software upgrades optimization", "software utility enhancement
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"usefulness of software upgrades improvement", "software utility
enhancement improvement", "software improvement enhancement", "software
improvement: usefulness enhancement", "software enhancement value
enhancement", "usefulness of software upgrades enhancement", "software
utility enhancement enhancement"],

"software_improvement_frequency ": ["software improvement: frequency",
"software enhancement regularity", "frequency of software upgrades",
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analysis", "software enhancement regularity analysis", "frequency of
software upgrades analysis", "software improvement frequency optimization",
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regularity optimization", "frequency of software upgrades optimization",
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frequency improvement", "software enhancement regularity improvement",
"frequency of software upgrades improvement", "software improvement
frequency enhancement", "quality of processes","quality of
process","processes quality", "software quality","softwares
quality","quality of softwares", "quality of software", "quality of the
softwares", "quality of the software", "quality of the processes", "quality
of the process", "process","processes","software improvement: frequency
enhancement", "software enhancement regularity enhancement", "frequency of
software upgrades enhancement"],

"agile_methodology_use ": ["use of agile methodology recognized as Kanban /
Scrum / Scrumban.", "Kanban / Scrum / Scrumban usage", "utilization of
recognized agile methodologies", "use of agile frameworks", "agile
methodology use analysis", "use of agile methodology recognized as Kanban /
Scrum / Scrumban. analysis", "Kanban / Scrum / Scrumban usage analysis",
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frameworks analysis", "agile methodology use optimization", "use of agile
methodology recognized as Kanban / Scrum / Scrumban. optimization", "Kanban
/ Scrum / Scrumban usage optimization", "utilization of recognized agile
methodologies optimization", "use of agile frameworks optimization", "agile
methodology use improvement", "use of agile methodology recognized as
Kanban / Scrum / Scrumban. improvement", "Kanban / Scrum / Scrumban usage
improvement", "utilization of recognized agile methodologies improvement",
"use of agile frameworks improvement", "agile methodology use enhancement",
"use of agile methodology recognized as Kanban / Scrum / Scrumban.
enhancement", "Kanban / Scrum / Scrumban usage enhancement", "kanban",
"scrum", "scrumban", "utilization of recognized agile methodologies
enhancement", "use of agile frameworks enhancement"],

"it_project_delay ": ["delay rate","lateness", "time delay", "delayed
completion", "postponement","delay of IT projects", "IT project
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postponement", "project delay analysis", "delay of IT projects analysis",
"IT project postponement analysis", "project delay optimization", "delay of
IT projects optimization", "IT project postponement optimization", "project
delay improvement", "delay of IT projects improvement", "IT project
postponement improvement", "project delay enhancement", "delay of IT
projects enhancement", "IT project postponement enhancement"],

"communication_technologies_use ": ["use of communication technologies",
"communication tools utilization", "communication methods usage",
"technology for communication", "communication technologies use analysis",
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utilization analysis", "communication methods usage analysis", "technology
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improvement", "technology for communication improvement", "communication
technologies use enhancement", "use of communication technologies
enhancement", "communication tools utilization enhancement", "communication
methods usage enhancement", "technology for communication
enhancement","technology adoption by customers", "customer technology
usage", "client use of new technologies", "customer adoption of new tech",
"client technology utilization"]
}

# Initialiser le dictionnaire pour stocker les comptages par section et
mot-clé
section_keyword_count_per_document = defaultdict(lambda: defaultdict(int))

# Parcourir les fichiers PDF
for filename in os.listdir(pdf_folder):
    if filename.endswith('.pdf'):
        pdf_path = os.path.join(pdf_folder, filename)
        doc = fitz.open(pdf_path)
        text = ''
        for page in doc:
            text += page.get_text()
        doc.close()
        for section, section_keywords in keywords_per_section.items():
            found_keywords = set()
            for keyword in section_keywords:
                if keyword.lower() in text.lower():
                    found_keywords.add(keyword)
            if found_keywords:
                section_keyword_count_per_document[section][filename] =
len(found_keywords)

# Créer un DataFrame à partir du dictionnaire
data = []
for section, document_counts in section_keyword_count_per_document.items():
    for document, count in document_counts.items():
        data.append([section, document, count])

result_df = pd.DataFrame(data, columns=['Section', 'Document PDF', 'Nombre
de Mots-Clés'])
```

```
# Exporter vers Excel
excel_output_path = 'resultats_mots_cles_par_section.xlsx'
result_df.to_excel(excel_output_path, index=False)

print("Résultats exportés vers", excel_output_path)

#%%

##Nombre de mots total dans les pdfs
import os
from PyPDF2 import PdfReader
from nltk.tokenize import word_tokenize
from nltk.corpus import stopwords

# Chemin vers le dossier contenant les fichiers PDF
dossier_pdf = "C:\\Users\\Thoma\\OneDrive\\Bureau\\Lecture pour mémoire
def"

# Liste pour stocker le texte extrait
texte_extraits = []

# Parcourir tous les fichiers PDF dans le dossier
for fichier in os.listdir(dossier_pdf):
    if fichier.endswith(".pdf"):
        chemin_fichier = os.path.join(dossier_pdf, fichier)
        with open(chemin_fichier, "rb") as pdf_file:
            pdf_reader = PdfReader(pdf_file)
            texte = ""
            for page in pdf_reader.pages:
                texte += page.extract_text()
            texte_extraits.append(texte)

# Fusionner tous les extraits de texte en un seul
texte_complet = " ".join(texte_extraits)

# Tokenization
mots = word_tokenize(texte_complet)

# Filtrer les mots vides (stop words)
mots_filtres = [mot.lower() for mot in mots if mot.isalpha() and
mot.lower() not in stopwords.words("french")]

# Compter le nombre total de mots
nombre_total_mots = len(mots_filtres)
print("Nombre total de mots dans les PDFs :", nombre_total_mots)

#%%

##Permet de trouver les TF-IDf de chaque KPI
import os
import PyPDF2
import nltk
from nltk.corpus import stopwords
from sklearn.feature_extraction.text import TfidfVectorizer


nltk.download('stopwords')
nltk.download('punkt')

# Chemin vers le dossier contenant les fichiers PDF
```

```
dossier_pdf = "C:\\Users\\Thoma\\OneDrive\\Bureau\\Lecture pour mémoire
def"

# Liste des sections avec les mots correspondants
sections = {
    "understanding_company_values ": ["employee perception",
"organizational values", "company culture", "values interpretation",
"employee engagement", "core values understanding", "value alignment",
"employee awareness", "cultural assimilation", "value integration",
"employee belief system", "value comprehension", "values communication",
"corporate ethos", "value interpretation", "cultural identity", "employee
value perception", "values adoption", "value congruence", "cultural
connection", "shared values understanding", "values-based behavior",
"employee value assimilation", "cultural congruence", "values
assimilation", "employee cultural alignment", "cultural identification",
"employee values awareness", "value orientation", "cultural fit", "employee
values integration", "value assimilation assessment", "values
appreciation", "employee value alignment", "value congruence assessment",
"cultural alignment measurement", "employee values interpretation",
"cultural adaptation", "values perception", "cultural understanding",
"value congruence assessment", "employee cultural awareness", "value
assimilation process", "cultural alignment strategies", "employee value
assimilation", "value assimilation measurement", "cultural value
perception", "values education and training","organizational values",
"organizational value", "understand the project", "understand the values"],

"understanding_employee_position ": ["job role clarity", "employee
hierarchy", "organizational structure", "position awareness", "job
responsibilities", "reporting lines", "role definition", "job title
understanding", "departmental alignment", "position description", "team
dynamics", "role expectations", "hierarchical knowledge", "functional
hierarchy", "role perception", "job function clarity", "team roles",
"reporting hierarchy", "team contribution", "role awareness", "department
relationships", "role visibility", "organizational chart", "functional
responsibilities", "role accountability", "team collaboration", "role
communication", "cross-functional awareness", "role significance", "role
differentiation", "team structure", "role alignment", "position context",
"departmental interactions", "role integration", "role recognition", "team
cooperation", "role differentiation", "hierarchical understanding",
"position impact", "team hierarchy", "role contribution", "role identity",
"team interdependence", "role empowerment", "role engagement", "team
synergy", "position relevance", "role collaboration", "team
cohesion","understanding of the employee's role within the company",
"employee's position comprehension within the organization", "awareness of
the employee's place in the company", "employee's role understanding within
the firm", "employee's position awareness within the organization",
"employee's role", "employee role", "employees role"],

"understanding_team_project ": ["project scope", "team objectives",
"project goals", "task comprehension", "collaborative synergy", "project
vision", "team alignment", "task coordination", "project mission", "team
dynamics", "task distribution", "project strategy", "team roles", "task
interdependence", "project plan", "team collaboration", "task delegation",
"project execution", "team communication", "task ownership", "project
progress", "team synchronization", "task accountability", "project
milestones", "team cooperation", "task visibility", "project timeline",
"team interactivity", "task engagement", "project deliverables", "team
synergy", "task completion", "project evaluation", "team cohesion", "task
accomplishment", "project assessment", "team harmony", "task efficiency",
"project performance", "team alignment", "task effectiveness", "project
success", "team coordination", "task contribution", "project outcome",
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efficiency", "task realization", "project results","team project",  "teams
projects", "project understanding", "team project understanding", ],

"desire_to_work ": ["employee motivation", "workplace attraction", "job
satisfaction", "career aspirations", "employee engagement", "company
appeal", "job fulfillment", "professional desire", "work interest",
"employee commitment", "company reputation", "job enthusiasm", "career
prospects", "employee dedication", "company culture fit", "job
contentment", "professional ambition", "workplace allure", "employee
loyalty", "company values alignment", "job passion", "career growth",
"employee attachment", "company mission alignment", "job fulfillment",
"professional drive", "workplace desirability", "employee pride", "company
vision alignment", "job contentment", "career motivation", "employee
satisfaction", "company purpose alignment", "job engagement", "career
dedication", "employee intent", "company identity fit", "job motivation",
"professional loyalty", "employee aspiration", "company philosophy
alignment", "job happiness", "career satisfaction", "employee eagerness",
"company ethos fit", "job loyalty", "professional commitment", "workplace
aspiration", "company principles alignment", "job dedication", "career
enthusiasm","motivation","motivate","motivations", "motivates","employee
motivation", "employees motivation"],

"employee_retention ": ["talent preservation", "staff longevity",
"workforce stability", "employee turnover", "staff retention", "workplace
retention", "workforce retention", "staff consistency", "workplace
consistency", "talent stability", "staff permanence", "workplace
permanence", "workforce permanence", "talent longevity", "staff loyalty",
"workplace loyalty", "workforce loyalty", "staff commitment", "workplace
commitment", "workforce commitment", "talent commitment", "staff
dedication", "workplace dedication", "workforce dedication", "talent
dedication", "staff retention strategies", "workplace retention
strategies", "workforce retention strategies", "talent retention
strategies", "staff turnover reduction", "workplace turnover reduction",
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retention programs", "staff engagement", "workplace engagement", "workforce
engagement", "talent engagement", "staff morale", "workplace morale",
"workforce morale", "talent morale", "staff job satisfaction", "workplace
job satisfaction", "workforce job satisfaction", "talent job satisfaction",
"staff well-being", "workplace well-being", "workforce well-being", "talent
well-being", "staff career growth", "workplace career growth", "workforce
career growth", "talent career growth","employee satisfaction","employees
satisfaction","employee satisfactions","employee satisafactions"],

"team_cohesion ": ["collaborative unity", "group harmony", "team
integration", "mutual support", "collective synergy", "group cooperation",
"team collaboration", "mutual trust", "collective alignment", "group
coordination", "team cohesion", "mutual understanding", "collective
solidarity", "group rapport", "team spirit", "mutual respect", "collective
teamwork", "group collaboration", "team unity", "mutual empathy",
"collective cohesiveness", "group camaraderie", "team harmony", "mutual
communication", "collective collaboration", "group cohesion", "team
synchronization", "mutual synergy", "collective integration", "group
teamwork", "team integration strategies", "mutual bond", "collective
alignment strategies", "group collaboration strategies", "team cohesion
strategies", "mutual support mechanisms", "collective trust-building",
"group cooperation methods", "team-building activities", "mutual
understanding approaches", "collective solidarity initiatives", "group
bonding exercises", "team-building workshops", "mutual respect guidelines",
"collective communication practices", "group harmony techniques", "team
cohesion efforts", "mutual synergy approaches", "collective alignment
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cohesion", "teams cohesion", "team collaboration", "teams collaboration"],

"learning_tasks ": ["task understanding", "job comprehension", "work
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clarification", "job understanding", "work responsibilities knowledge",
"task scope grasp", "duties recognition", "task complexity comprehension",
"job requirements understanding", "work tasks familiarity", "task
expectations clarity", "duties specifications awareness", "task objectives
recognition", "job tasks grasp", "workload understanding", "task details
comprehension", "duties intricacies awareness", "task responsibilities
recognition", "job duties clarity", "workload breakdown comprehension",
"task goals understanding", "duties components awareness", "task functions
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comprehension", "task role understanding", "duties elements awareness",
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grasp", "task responsibilities comprehension", "duties duties awareness",
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understanding", "work responsibilities breakdown comprehension", "task
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responsibilities comprehension", "task intricacies understanding", "duties
components recognition", "task functions comprehension","work
improvement","work improvements", "improve the quality of work", "improving
the quality of work", "improving performance", "improve performance",
"improves performance"],

"learning_skills ": ["skill understanding", "competence comprehension",
"capability awareness", "skillset clarification", "talent understanding",
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familiarity", "expertise awareness", "proficiency understanding",
"competency grasp", "skill competency recognition", "capability proficiency
knowledge", "skillset expertise grasp", "expertise proficiency
recognition", "proficiency competency comprehension", "competency
proficiency grasp", "skill competency familiarity", "capability expertise
recognition", "skillset proficiency awareness", "expertise competency
knowledge", "proficiency skill grasp", "competency capability
understanding", "skill competency comprehension", "capability proficiency
recognition", "skillset competency grasp", "expertise proficiency
comprehension", "proficiency competency recognition", "competency
proficiency familiarity", "skill capability understanding", "capability
proficiency comprehension", "skillset expertise recognition", "expertise
proficiency grasp", "proficiency competency familiarity", "competency
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comprehension", "skill capability recognition", "capability proficiency
awareness", "skillset competency familiarity", "expertise proficiency
knowledge", "proficiency skill comprehension","skills improvement", "skill
improvement", "skills improvements", "skills improvement"],

"meeting_frequency ": ["meeting occurrence", "gathering frequency",
"session regularity", "conference consistency", "assemblage interval",
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"discussion regularity", "meetup cadence", "convening rate", "session
frequency", "meeting schedule", "gathering frequency patterns", "session
occurrence trends", "conference regularity trends", "assemblage interval
analysis", "discussion frequency changes", "meetup cadence variations",
"convening rate fluctuations", "session frequency shifts", "meeting
schedule adjustments", "meeting frequency optimization", "gathering
regularity enhancement", "session consistency improvement", "conference
occurrence refinement", "assemblage frequency enhancement", "discussion
regularity improvement", "meetup cadence enhancement", "convening rate
refinement", "session frequency enhancement", "meeting schedule
improvement", "meeting frequency trends", "gathering regularity patterns",
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frequency analysis", "discussion regularity changes", "meetup cadence
variations", "convening rate fluctuations", "session frequency shifts",
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occurrence evaluation", "assemblage frequency assessment", "discussion
regularity analysis", "meetup cadence evaluation", "convening rate
analysis", "session frequency evaluation", "meeting schedule analysis",
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"team_diversification ": ["team diversity", "diversity of team members",
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"software_understanding_ability ": ["employee software comprehension",
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"employee_motivation ": ["employee job motivation", "employee work
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"employee_training ": ["employee's training", "staff training", "training
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"employee_error_rate ": ["employee error rate", "staff mistake frequency",
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"new_technologies_use ": ["use of new technologies by customers",
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"process_quality_error ": ["process/software quality: error (bug)",
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"software_improvement_usefulness ": ["software improvement: usefulness",
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usage", "client use of new technologies", "customer adoption of new tech",
"client technology utilization"]
}
# Fonction pour extraire le texte d'un fichier PDF
def extract_text_from_pdf(file_path):
    with open(file_path, 'rb') as file:
        pdf_reader = PyPDF2.PdfReader(file)
        text = ''
        for page in pdf_reader.pages:
            text += page.extract_text()
        return text

# Chargement des stopwords pour le français
stop_words = set(stopwords.words('english'))

# Dictionnaire pour stocker les valeurs TF-IDF par section
tfidf_scores_per_section = {section: 0.0 for section in sections}

# Traitement de chaque fichier PDF
for filename in os.listdir(dossier_pdf):
    if filename.endswith('.pdf'):
        file_path = os.path.join(dossier_pdf, filename)
        text = extract_text_from_pdf(file_path)

        # Initialisation du vecteur TF-IDF
        tfidf_vectorizer = TfidfVectorizer(stop_words=stop_words)

        # Calcul du TF-IDF pour le texte du fichier PDF
        tfidf_matrix = tfidf_vectorizer.fit_transform([text])

        # Récupération des mots et de leur valeur TF-IDF
        feature_names = tfidf_vectorizer.get_feature_names()
        tfidf_scores = tfidf_matrix.toarray()[0]

        # Ajout des valeurs TF-IDF aux sections appropriées
        for section, mots_section in sections.items():
            for mot in mots_section:
                if mot in feature_names:
                    index_mot = feature_names.index(mot)
                    tfidf_scores_per_section[section] +=
tfidf_scores[index_mot]

# Affichage des scores TF-IDF par section
for section, score in tfidf_scores_per_section.items():
    print(f"Section: {section}, Score TF-IDF total: {score}")
```

```
#%%

## Permet de télécharger les résultats sous forme de fichiers excels
import pandas as pd

# Création d'une liste de tuples contenant les noms de section et leurs
importances
data = [(section, score) for section, score in
tfidf_scores_per_section.items()]

# Création d'un DataFrame à partir de la liste de tuples
df = pd.DataFrame(data, columns=['Section', 'Importance'])

# Tri du DataFrame par ordre décroissant d'importance
df = df.sort_values(by='Importance', ascending=False)

# Création du fichier Excel
nom_fichier_excel = 'importance_sections_final3.xlsx'
df.to_excel(nom_fichier_excel, index=False)

print(f"Le fichier Excel '{nom_fichier_excel}' a été créé avec succès.")

#%%

## Permet d'avoir les titres des articles
import os
import PyPDF2

def get_pdf_titles(folder_path):
    pdf_titles = []

    # Vérifie que le chemin spécifié est un dossier
    if not os.path.isdir(folder_path):
        print("Le chemin spécifié n'est pas un dossier valide.")
        return pdf_titles

    # Récupère la liste des fichiers PDF dans le dossier
    pdf_files = [f for f in os.listdir(folder_path) if
f.lower().endswith('.pdf')]

    # Parcourt chaque fichier PDF et récupère le titre
    for pdf_file in pdf_files:
        file_path = os.path.join(folder_path, pdf_file)
        with open(file_path, 'rb') as file:
            try:
                pdf_reader = PyPDF2.PdfFileReader(file)
                title = pdf_reader.getDocumentInfo().title
                pdf_titles.append(title)
            except:
                pdf_titles.append(f"Titre non disponible pour {pdf_file}")

    return pdf_titles

# Spécifie le chemin du dossier contenant les fichiers PDF
dossier_pdf = "C:\\Users\\Thoma\\OneDrive\\Bureau\\Lecture pour mémoire
def"
titres_articles = get_pdf_titles(dossier_pdf)

# Affiche les titres des articles
```

```python
for i, titre in enumerate(titres_articles, start=1):
    print(f"Article {i}: {titre}")
```

Annexe 4.1. KPIs sélectionnés et justifications

Dimension	Description du KPI	Titre	Auteurs
Culture	La compréhension du projet de l'équipe	Perception des méthodes agiles par les développeurs aujourd'hui	Gauthier Florian, Deneckère Rébecca
Culture	L'envie de travailler pour l'entreprise	Job Satisfaction and Motivation in a Large Agile Team	Bjørnar Tessem and Frank Maurer
Culture	La rétention d'employé	Entreprise agility : Buzz or business impact	McKinsey & Company
Culture	La cohésion d'équipe	Entreprise agility : Buzz or business impact	McKinsey & Company
Culture	L'attractivité de l'entreprise sur le marché de l'emploi	Identify the Relationship between Employer Brand Attractiveness, Job Satisfaction, Organizational Commitment and Workforce Agility in Telecom Industries based on Structural Equation Modeling (SEM) (Case Study: Huawei Technologies Service Iranian)	Zoya Aidan, Ahmad Alibabaei, Hassan Shah Mohammad
Culture	L'apprentissage vis-à-vis des tâches à faire	Relation between the learning organization and organizational agility	Canan Yildiran, Oya Önalan, Gökhan Iruç Önalan
Culture	L'apprentissage vis-à-vis des skills à avoir	A Framework for Self-Organized Learning Environments to Develop Soft Skills in Geographically Distributed and Multicultural Engineering Teams	Eduardo Daniel Juárez, Noreha Abdul Malik, Ivo Ayala, Anis Nurashikin Nordin, Nadirah Abdul Rahim
Culture	La fréquence de réunions	Perception des méthodes agiles par les développeurs aujourd'hui	Gauthier Florian, Deneckère Rébecca
Culture	L'utilité des réunions	Perception des méthodes agiles par les développeurs aujourd'hui	Gauthier Florian, Deneckère Rébecca
Leadership	Le nombre de conflits au sein de l'équipe	Conflict Resolution in team : Analysing the cause of conflicts and best skills for conflicts resolution	Tawfig Adham

Leadership	Le nombre de conflits entre différentes équipes	Communication differencies and conflict construction in working teams	Redlich A, Gurieva S.D.
Leadership	Le nombre de conflits avec son manager	Conflict Resolution in team : Analysing the cause of conflicts and best skills for conflicts resolution	Tawfig Adham
Leadership	La satisfaction liée à la gestion de son manager direct	Empirically developed framework for building trust in distributed agile teams	Sulabh Tyagi, Ritu Sibal, Bharti Suri
Leadership	La satisfaction liée à la gestion de l'entreprise de manière globale	Identify the Relationship between Employer Brand Attractiveness, Job Satisfaction, Organizational Commitment and Workforce Agility in Telecom Industries based on Structural Equation Modeling (SEM) (Case Study: Huawei Technologies Service Iranian)	Zoya Aidan, Ahmad Alibabaei, Hassan Shah Mohammad
Leadership	La satisfaction liée à la gestion du personnel	Entreprise agility : Buzz or business impact	McKinsey & Company
Leadership	Les discriminations dans l'entreprise	Gender Differences in leadership : Rôle of Gender Diversity, Leadership Stylen Cultural Influence and Leadership Behavior	Sara Alhassan, mohammed A. Al Doghan
Leadership	L'utilité des feedbacks	Job Satisfaction and Motivation in a Large Agile Team	Bjørnar Tessem and Frank Maurer
Leadership	La fréquence de feedbacks	Job Satisfaction and Motivation in a Large Agile Team	Bjørnar Tessem and Frank Maurer
Organisation	L'attractivité du lieu de travail	Unlocking Agility : An Insider's Guide To Agile Entreprise Transformation	Jorgen Hesselberg
Organisation	La performance liée au lieu de travail	Entreprise agility : Buzz or business impact	McKinsey & Company
Organisation	L'adaptabilité du lieu de travail	Unlocking Agility : An Insider's Guide To Agile Entreprise Transformation	Jorgen Hesselberg
Organisation	Le partage de connaissance au sein de l'équipe	Entreprise agility : Buzz or business impact	McKinsey & Company

Organisation	Le partage de connaissance à l'extérieur de l'équipe	Entreprise agility : Buzz or business impact	McKinsey & Company
Organisation	Le bien-être physique sur le lieu de travail	Unlocking Agility : An Insider's Guide To Agile Entreprise Transformation	Jorgen Hesselberg
Organisation	La facilité de communication sur le lieu de travail	Entreprise agility : Buzz or business impact	McKinsey & Company
Organisation	La facilité de communication avec les managers	Organizational Culture and Leadership, 4th edition	R.H. Schein
Organisation	La facilité de communication avec l'équipe	Relation between the learning organization and organizational agility	Canan Yildiran, Oya Önalan, Gökhan Iruç Önalan
Organisation	La facilité de communication avec une équipe différente	Technical-, Social- and Process Debt in Large-Scale Agile: An Exploratory Case-Study	Antonio Martini, viktoria Stray, Nils Brede moe
Personnes	La diversification au sein de l'équipe	Network Structure shapes the Impact of Diversity in Collective Learning	Fabian Baumann, Agnieszka Czaplicka, and Iyad Rahwan
Personnes	La diversification au sein des postes de l'entreprise	Network Structure shapes the Impact of Diversity in Collective Learning	Fabian Baumann, Agnieszka Czaplicka, and Iyad Rahwan
Personnes	La compréhension et capacité d'utilisation des logiciels (software) par les employés	Unlocking Agility : An Insider's Guide To Agile Entreprise Transformation	Jorgen Hesselberg
Personnes	La compréhension et la capacité d'utilisation des outils (hardware) par les employés	Unlocking Agility : An Insider's Guide To Agile Entreprise Transformation	Jorgen Hesselberg
Personnes	La flexibilité apportée par l'entreprise au niveau du travail	Job Satisfaction and Motivation in a Large Agile Team	Bjørnar Tessem and Frank Maurer

Personnes	La flexibilité apportée par l'entreprise au niveau des horaires	Flexibility and Agility For Enterprise Synchronization: Knowledge and Innovation Management Towards Flexagility	Prof. S. Wadhwa Mr K.S. Rao
Personnes	La motivation des employés à bien faire leur travail	Identify the Relationship between Employer Brand Attractiveness, Job Satisfaction, Organizational Commitment and Workforce Agility in Telecom Industries based on Structural Equation Modeling (SEM) (Case Study: Huawei Technologies Service Iranian)	Zoya Aidan, Ahmad Alibabaei, Hassan Shah Mohammad
Personnes	Les formations	Workforce Agility: A Review of Literature	Ashutosh Mudul
Personnes	Le taux d'erreur des employés	AGILITY FACTORS AND THEIR IMPACT ON PRODUCT DEVELOPMENT PERFORMANCE	E. Rebentisch, E. C. Conforto, G. Schuh, M. Riesener, J. Kantelberg, D. C. Amaral and S. Januszek
Technologie	L'utilisation des nouvelles technologies par les clients	Technologies de l'information et organisation : de la tentation à la flexibilité à la centralisation	P-J. Benghozi
Technologie	La qualité des processus/logiciels : vitesse d'exécution	The effects of test driven development on internal quality, external quality and productivity: A systematic review	Wilson Bissi, Adolfo Gustavo Serra Seca Neto, Maria Claudia Figueiredo Pereira Emer
Technologie	La qualité des processus/logiciels : erreur (bug)	Agile to Lean Software Development Transformation: a Systematic Literature Review	Filip Kiss, Bruno Rossi
Technologie	Amélioration des logiciels : utilité	Entreprise agility : Buzz or business impact	McKinsey & Company
Technologie	Amélioration des logiciels : fréquence	Entreprise agility : Buzz or business impact	McKinsey & Company
Technologie	L'utilisation des méthodologies agile reconnue comme Kanban/Scrum/Scrumban.	Perception des méthodes agiles par les développeurs aujourd'hui	Gauthier Florian, Deneckère Rébecca
Technologie	Le retard des projets informatiques	Perception des méthodes agiles par les développeurs aujourd'hui	Gauthier Florian, Deneckère Rébecca

Technologie	L'utilisation des technologies de communication	La flexibilité de l'entreprise	DAHOU HACINI Khadra, HACINI Ishaq
KPI opérationnel	Le chiffre d'affaires	a dynamic panel study on digitalization and firm's agility : What drives agility in advanced economies 2009-2018	Marinko Skare, Domingo Riberio Soriano
KPI opérationnel	Le nombre d'employés	a dynamic panel study on digitalization and firm's agility : What drives agility in advanced economies 2009-2018	Marinko Skare, Domingo Riberio Soriano
KPI opérationnel	Le volumes de clients	Agility and proximity considerations in spply chain desing	Michael K. Lim, Ho-yin Mak, Zuo-jun Max Shen
KPI clients	La satisfaction des clients liés par rapport aux produits proposés par l'entreprise	Analysing the impact of supply chain agility on customer satisfaction through responsiveness and innovation	Mustafa Hussain Navqi, Asim, Dr. Muhammaed, Salman Manzoor

Annexe 4.2. Titre et auteurs des articles sélectionnés

Dans cette annexe, nous retrouvons le titre et les auteurs des 123 articles utilisés pour la recherche des poids pour nos KPIs.

Titre	**Auteurs**
Achieving Supply Chain 4.0 and the Importance of Agility, Ambidexterity, and Organizational Culture: A Case of Indonesia	Firdaus Alamsjah, Erlinda N. Yunus
A contribution to the definition of students group agility measures within the Social Network based Education in the context of evaluation of students' effective learning of Industry 4.0 skills	Goran Putnik, Cátia Alves, Leonilde Varela, Pedro Pinheiro, Manuel Victor, Zenilda Manuel
Adapting the scrum framework for agile project management in science: case study of a distributed research initiative	Enric Senabre Hidalgo
Adaptive monitoring, detection, and response for agile digital service chains	Matteo Repetto
A Decision Support System to Operationalize Customer-Centric Sustainability	Khaled Medini, Thorsten Wuest, Elham Jelodari, David Romeroc, Valérie Laforestt
Achieving Supply Chain 4.0 and the Importance of Agility, Ambidexterity, and Organizational Culture: A Case of Indonesia	Firdaus Alamsjah

A contribution to the definition of students group agility measures within the Social Network based Education in the context of evaluation of students' effective learning of Industry 4.0 skills	Goran Putnik, Cátia Alves, Leonilde Varela, Pedro Pinheiro, Manuel Victor, Zenilda Manuel
Adapting the scrum framework for agile project management in science: case study of a distributed research initiative	Enric Senabre Hidalgo
Adaptive monitoring, detection, and response for agile digital service chains	Matteo Repetto
A Decision Support System to Operationalize Customer-Centric Sustainability	Khaled Medini
A deep learning-based expert finding method to retrieve agile software teams from CQAs	Peyman Rostami
A framework for generating agile methods for product development	Jonas Heimicke
A Fuzzy AHP-based approach for prioritization of cost overhead factors in agile software development	Syed Abusaeed, Saif Ur Rehman Khan, Atif Mashkoor
Agile clinical research: A data science approach to scrumban in clinical medicine	Howard Lei
Agile Digitale Transformation of Enterprise Architecture Models in Engineering Collaboration	Sergej Bondar
Agile management to secure competitiveness in times of digital transformation in medium-sized businesses	Diana Marie Wiechmann, Christopher Reichstein, Ralf-Christian Haerting, Joerg Bueechl, Michael Pressl
Agile meeting method for building intelligent decision support systems	Guilherme Nascimento Pate Santos , Carlos Jose´ Pereira De Lucena
Agile methods used by traditional logistics companies and logistics start-ups: a systematic literature review	Malena Zielske, Tobias Held
Agile Model-Driven Methodology to Implement Corporate Social Responsibility	R. Grangel, C. Campos
AGILE Paradigm: The next generation collaborative MDO for the development of aeronautical systems	Pier Davide Ciampa, Bjorn Nagel
Agile project management challenge in handling scope and change: A systematic literature review	Primadhika Marnada,Teguh Raharjo, Bob Hardian, Adi Prasetyo
Agile software development and UX design: A case study of integration by mutual adjustment	John Stouby Persson, Anders Bruun, Marta Kristín Larusdottir, Peter Axel Nielsen
Agility as a force to emerge from the darkness to better days	Brenda Souza Rosa Silva, Selma Regina Martins Oliveira
Agility Capability Maturity Framework	Agnieszka Stachowiak, Joanna Oleśków-Szłapka
A goal programming approach for agile-based software development resource allocation	Jasmine Kaur, Ompal Singh, Adarsh Anand, Mohini Agarwal
Algorithms to analyze the impact of change on Enterprise Architecture	Imgharene Kawtar, Doumi Karim, Baina Salah

A measure of agility as the complexity of the enterprise system	B.M. Arteta, R.E. Giachetti
A model-driven framework to support strategic agility: Value-added perspective	Konstantinos Tsilionis, Yves Wautelet
A Model for Measuring the Direct and Indirect Impact of Business Intelligence on Organizational Agility with Partial Mediatory role of Empowerment (Case Study:	Rasoul Danesh GhalichKhania, Mohammad Hakkak

Tehran Construction Engineering Organization (TCEO) and ETKA Organization Industries.co)	
An agile manufacturing conceptual model of performance measure factors for SMEs in Gujarat	N.S. Patel, P.K. Brahmbhatt
An evaluation of agile Ontology Engineering Methodologies for the digital transformation of companies	Daniele Spoladore, Elena Pessot
A novel agile ontology engineering methodology for supporting organizations in collaborative ontology development	Daniele Spoladore, Elena Pessot, Alberto Trombetta
Approaches to manage the user experience process in Agile software development: A systematic literature review	Andreas Hinderks, Francisco José Domínguez Mayo, Jörg Thomaschewski, María José Escalona
A review of enterprise agility: Concepts, frameworks, and attributes	Bohdana Sherehiy, Waldemar Karwowski, John K. Layer
Assessment of Agile manufacturing impact on business performance of Indian manufacturing industry: A PLS-SEM approach	Rahul Kumar, Kanwarpreet Singh , Sanjiv Kumar Jain
A study of the barriers to the adoption of integrated sustainable-green-leansix sigma-agile manufacturing system (ISGLSAMS) in Indian manufacturing organizations	Dharmendra Hariyani, Sanjeev Mishra, Milind Kumar Sharma, Poonam Hariyani
A taxonomy of scaling agility	Everist Limaj, Edward W.N. Bernroider
Benefits realisation in an agile environment	Carl Marnewick, Annlize L. Marnewick
Business analytics competencies in stabilizing firms' agility and digital innovation amid COVID-19	Cai Li, Adnan Khana, Hassan Ahmad, Mohsin Shahzad
Can data analytics raise marketing agility? A sense-and-respond perspective	David D.C. Tarn, Juefan Wang
Collaborative Project Management Framework for Partner Network Initiation	Eduard Shevtshenko, Igor Poljantchikov, Kashif Mahmooda, Taivo Kangilasski, Alexander Norta
Combining Design Thinking and Agile to Implement Condition Monitoring System: A Case Study on Paper Press Bearings	Rene Vinicio Sanchez, Julio Fernando Siguencia, Mauricio Villacıs Diego Cabrera, Mariela Cerrada, Fernando Heredia
Comparative analysis of lean and agile supply chain strategies for effective vaccine distribution in pandemics: A case study of COVID-19 in a densely populated developing region	Kasuni R.R. Gomes, H. Niles Perera, Amila Thibbotuwawa, N.P. Sunil-Chandra

Considering polyvalence when minimizing workload fulfillment	France-Anne Gruat-La-Forme* , Valérie Botta-Genoulaz** , Jean-Pierre Campagne
Coopetition, organizational agility, and innovation performance in digital new ventures	Runping Guo, Haobo Yin, Xiao Liu
Coping with disruptions in complex systems: a framework	Sondes Chaabane, Damien Trentesaux
Co-productive agility and four collaborative pathways to sustainability transformations	Josephine M. Chambers, Carina Wyborn, Nicole L. Klenk, Melanie Ryan, Anca Serban, Nathan J. Bennett, Ruth Brennan, Lakshmi Charli-Joseph, María E. Fernandez-Gimenez, Kathleen A. Galvin, Bruce E. Goldstein, Tobias Haller, Rosemary Hill, Claudia Munera, Jeanne L. Nel, Henrik Osterblom, Robin S. Reid, Maraja Riechers, Marja Spierenburg, Maria Tengo, Elena Bennett, Amos Brandeis,

	Paul Chatterton, Jessica J. Cockburn, Christopher Cvitanovic, Pongchai Dumrongrojwatthana, America Paz Duran, Jean-David Gerber, Jonathan M. H. Green, Rebecca Gruby, Angela M. Guerrero, Andra-Ioana Horcea-Milcu, Jasper Montana, Patrick Steyaert, Julie G. Zaehringer, Angela T. Bednarek, K Curran, Salamatu J. Fada, Jon Hutton, Beria Leimona, Tomas Pickering, Renee Rondeau
DECIDE: An Agile event-and-data driven design methodology for decisional Big Data projects	Llia Sfaxi, Mohamed Mehdi Ben Aissa
Deep-Learning-Based Agile Teaching Framework of Software Development Courses in Computer Science Education	Jian Yanga, Xiao Ling Zhang, Peng Su
Deploying predictive analytics to enhance patient agility and patient value in hospitals: A position paper and research proposal	Damien S.E. Broekharst, Rogier van de Wetering, Ward Ooms, Remko W. Helms, Nadine Roijakkers
Developing a framework to overcome communication challenges in agile distributed teams – Case study of a Mauritian-based IT service delivery centre	Kushal Bundhun, Roopesh Kevin Sungkur
Developing Organizational Agility in SMEs: An Investigation of Innovation's Roles and Strategic Flexibility	I Wayan Edi Arsawan , Ni Kadek Dessy Hariyanti, I Made Ari Dwi Suta Atmaja, Dwi Suhartanto and Viktor Koval
Development and proposal of a LARG (lean, agile, resilient, green) performance measurement system for a food supply chain	Eleonora Bottani, Barbara Bigliardi, Marta Rinaldi
Development of a Digital Performance Assessment Model for Quebec Manufacturing SMEs	Sébastien Gamache, ING., M. SC. A., Georges Adul-Nour, ING., PH. D. and Chantal Baril, ING., PH. D
Digital readiness of small and medium enterprises in emerging markets: The construct, propositions, measurement, and implications	Srinivas R. Pingali, Sumanta Singha, S. Arunachalam, Kiran Pedada
Does maturity level influence the use of Agile UX methods by digital startups? Evaluating design thinking, lean startup, and lean user experience	Fernando Henrique Lermen, Paula Kvitko de Moura, Vanessa Becker Bertoni, Paola Graciano, Guilherme Luz Tortorella

Do scaling agile frameworks address global software development risks? An empirical study	Sarah Beecham, Tony Clear, Ramesh Lal, John Noll
Effect of agility in different dimensions of manufacturing systems: A review	Sameer Sharma, Jaspreet Singh Oberoi, Rahul Dev Gupta, Sanjeev Saini, Arun Kumar Gupta, Neeraj Sharma
Effects of supply chain transparency, alignment, adaptability, and agility on blockchain adoption in supply chain among SMEs	Mohammad Iranmanesh, Parisa Maroufkhani, Shahla Asadi, Morteza Ghobakhloo, Yogesh K. Dwivedi, Ming-Lang Tseng
Employee agility and enterprise social media: The Role of IT proficiency and work expertise	Abdul Hameed Pitafi, Muhammad Imran Rasheed, Shamsa Kanwal, Minglun Ren
Enablers of workforce agility, firm performance, and corporate reputation	Kalyan Prasad Das, Susmita Mukhopadhyay, Damodar Suar
Enhancing enterprise agility by deploying agile drivers, capabilities and providers	Yi-Hong Tseng, Ching-Torng Lin
Enterprise architecture for high flexible and agile company in automotive industry	Duarte Gonçalves, Luís Ferreira, Nuno Campos
Entrepreneurial leadership and employees' innovative behavior: A sequential mediation analysis of innovation climate and employees' intellectual agility	Mashael Abdulaziz Malibari , Saleh Bajaba
Evaluating agility in corporate enterprises	Anirban Ganguly, Roshanak Nilchiani, John V. Farr

Factors affecting Agile adoption: An industry research study of the mobile app sector in Saudi Arabia	Fahad S. Altuwaijri, Maria Angela Ferrario
Factors affecting the development of workforce versatility	El-Awady Attia, Virgil Dumbrava, Philippe Duquenne
Freight Transportation Resilience Enabled by Physical Internet	Yanyan Yang, Shenle Pan, Eric Ballot
Genetic algorithm based probabilistic model for agile project success in global software development	Mohammad Shameem, Mohammad Nadeem, Abu Taha Zamani
How does artificial intelligence create business agility? Evidence from chatbots	Xuequn Wang, Xiaolin Lin, Bin Shao
How social networking ties mediate the associations between enterprise social media affordances and employee agility?	Shalini Talwar, Adeel Luqman, Puneet Kaur, Pallavi Srivastava, Shreya Mishra
Impact of absorptive capacity on project success through mediating role of strategic agility: Project complexity as a moderator	Mario Nuno Mata, Jose Moleiro Martins, Pedro Leite Inacio
Impact of artificial intelligence-driven big data analytics culture on agility and resilience in humanitarian supply chain: A practice-based view	Rameshwar Dubey, David J. Bryde, Yogesh K. Dwivedi, Gary Graham, Cyril Foropon
Implications of using Industry 4.0 base technologies for lean and agile supply chains and performance	Diessica de Oliveira-Dias, Juan Manuel Maqueira-Marin, Jose Moyano-Fuentes, Helena Carvalho
Improving the agility of employees through enterprise social media: The mediating role of psychological conditions	Zhao Cai, Qian Huang, Hefu Liu, Xiaoyan Wang

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Job performance through mobile enterprise systems: The role of organizational agility, location independence, and task characteristics	Sunghun Chung, Kyung Young Lee, Kimin Kim
Job satisfaction in agile information systems development: A stakeholder perspective	Veronika Huck-Fries, Francisca Nothaft, Manuel Wiesche, Helmut Krcmar
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Managing agile ramp-up projects in manufacturing – Status quo and recommendations	Juliette Heraud, Khaled Medini, Ann-Louise Andersen
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Motivators Influencing the Efficiency and Commitment of Employees of Agile Teams	Mateusz Trzeciak and Paulina Banasik
Neural Network Based Text Mining to Discover Enterprise Networks	K. Hajlaoui, X. Boucher
Operationalising and evaluating redundancy and flexibility-based management strategies within a queuing system	Jonathon Mackay, Albert Munoz, Matthew Pepper, Emily Ryan
Organizational ambidexterity and competitive advantage: The role of strategic agility in the exploration-exploitation paradox	Thomas Clauss, Sascha Kraus, Friedrich Lukas Kallinger, Peter M. Bican, Alexander Brem, Norbert Kailer
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Pharmacovigilance des médicaments et des vaccins contre la COVID-19 durant la pandémie : comment le Réseau franc¸ais des centres régionaux de pharmacovigilance a relevé le défi	Pharmacovigilance des médicaments et des vaccins contre la COVID-19 durant la pandémie : comment le Réseau franc¸ais des centres régionaux de pharmacovigilance a relevé le défi
Predicting the relationships between virtual enterprises and agility in supply chains	Ariunbayar Samdantsoodol, Shuang Cang, Hongnian Yu, Alan Eardley, Asralt Buyantsogt
Proposal model of change for Business IT Alignment	Imgharene Kawtar, Doumi Karim, Baina Salah
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Re-Envisioning Pharmaceutical Manufacturing: Increasing Agility for Global Patient Access	Marquerita Algorri, Michael J. Abernathy, Nina S. Cauchon, Twinkle R. Christian, Celeste Frankenfeld Lamm, Christine M.V. Moore
Remote agile: Problems, solutions, and pitfalls to avoid	Riku Reunamaki, Carl F. Fey
Revealing the state of the art of large-scale agile development research: A systematic mapping study	Ömer Uludağ, Pascal Philipp, Abheeshta Putta, Maria Paasivaara, Casper Lassenius, Florian Matthes

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Strategic agility of Korean small and medium enterprises and its influence on operational and firm performance	Hojung Shin, Jae-Nam Lee, DaeSoo Kim, Hosun Rhim
Strategic agility of SMEs in emerging economies: Antecedents, consequences and boundary conditions	Samuel Adomako, Joseph Amankwah-Amoah, Francis Donbesuur, Mujtaba Ahsan, Albert Danso, Moshfique Uddin

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Strategic Management for the Internationalization and Cooperative Markets	Martín López, V. M., Ruiz Guerra, I
The economics of cloud computing on educational services	C Boja, Paul Pocatilu, Cristian Toma
The impact of social capital and collaborative knowledge creation on e-business proactiveness and organizational agility in responding to the COVID-19 crisis	Khaled Saleh Al-Omoush, Virginia Simón-Moya, Javier Sendra-García
The influence of Knowledge Based Economy on agility of enterprise	Stefan Trzcielinski
The interplay between dynamic capabilities' dimensions and their relationship to project portfolio agility and success	Jadena Bechtel, Carsten Kaufmann, Alexander Kock
The power of moving fast: responsible leadership, psychological empowerment and workforce agility in energy sector firms	Szymon Cyfert, Witold Szumowski, Wojciech Dyduch, Maciej Zastempowski, Paweł Chudzinski
The role of dynamic capabilities and strategic agility of B2B high-tech small and medium-sized enterprises during COVID-19 pandemic: Exploratory case studies from Finland	Nadia Zahoor, Ismail Golgeci, Lauri Haapanen, Imran Ali, Ahmad Arslan
The role of knowledge-based resources in Agile Software Development contexts	Raquel Ouriques, Krzysztof Wnuk, Tony Gorschek, Richard Berntsson Svensson
Time to clean up food production? Digital technologies, nature-driven agility, and the role of managers and customers	Moreno Frau, Ludovica Moi, Francesca Cabiddu, Tamara Keszey
Télétravail contraint en pandémie, nouveau risque psychosocial : réflexions sur les enjeux santé et l'accompagnement nécessaire	A. Chamoux
Towards a generic meta-model for PSS scenarios modelling and analysis	Xavier Boucher, Khaled Medini
Towards agility in international high-tech SMEs: Exploring key drivers and main outcomes of dynamic capabilities	Vahid Jafari-Sadeghi, Hannan Amoozad Mahdiraji , Donatella Busso, Dorra Yahiaoui
Towards a proactive vision of the training for the 4.0 Industry: From the required skills diagnostic to the training of employees	François MARMIER, Ioana DENIAUD, Ivana RASOVSKA, Jean-Louis MICHALAK
Towards a real-time business processes validation algorithm	Asma Ouarhim , Karim Baïna
Towards a smart connector for dynamic interoperability in agile enterprises	F. Belkadi, J. Vieille, B. Tanous
Using agile methodologies for adopting COBIT	Ana Cláudia Amorim, Miguel Mira da Silva, Rúben Pereira, Margarida Gonçalves
Voices from within. To what extent can internal crowdsourcing drive a change in organizational culture?	Juan Ramon Campos-Blazquez, Luis Rubio-Andrada, María Soledad CelemínPedroche
What factors affect firm performance in the hotel industry post-Covid-19 pandemic? Examining the impacts of big data analytics capability, organizational agility and innovation	Muhamad Luqman Khalil, Norzalita Abd Aziz, Fei Long, Huan Zhang
When and how ESM affects creativity: The role of communication visibility and employee agility in a cross-cultural setting	Muhammad Imran Rasheed, Abdul Hameed Pitafi, Shreya Mishra, Varun Chotia

Why the agile mindset matters	Karen Eilers, Christoph Peters, Jan Marco Leimeister
Women entrepreneurs in Tunisia within the context of the covid-19: Constraints, dilemmas and resilience behavior	Raja Cherif, Boutheina Sassi, Mehrez Chaher

Annexe 4.3. Poids des KPIs

Dans cette annexe, nous pouvons constater deux choses. La première est les mots-clés utilisés pour chercher les KPIs dans la littérature. La deuxième est la valeur TF-IDF de chacun de nos KPIs. Pour rappel, nous définissons la non-significativité des KPIs seulement pour notre méthode de recherche.

Dimension	**Libellé du KPI**	**Mots clés sur base de groupe et mots clés**	**Valeur TF-IDF**

Culture	La compréhension du projet de l'entreprise et de ses valeurs par les employés	"understanding_company_values ": ["employee perception", "organizational values", "company culture", "values interpretation", "employee engagement", "core values understanding", "value alignment", "employee awareness", "cultural assimilation", "value integration", "employee belief system", "cultural resonance", "value comprehension", "values communication", "corporate ethos", "value interpretation", "cultural identity", "employee value perception", "values adoption", "value congruence", "cultural connection", "shared values understanding", "values-based behavior", "employee value assimilation", "cultural congruence", "values assimilation", "employee cultural alignment", "cultural identification", "employee values awareness", "value orientation", "cultural fit", "employee values integration", "cultural resonance", "value assimilation assessment", "values appreciation", "employee value alignment", "value congruence assessment", "cultural alignment measurement", "employee values interpretation", "cultural adaptation", "values perception", "cultural understanding", "value congruence assessment", "employee cultural awareness", "value assimilation process", "cultural alignment strategies", "employee value assimilation", "value assimilation measurement", "cultural value perception", "values education and training", "organizational values", "organizational value", "understand the project", "understand the values"],	Non significatif

Culture	La compréhension de la place de l'employé au sein de l'entreprise	"understanding_employee_position ": ["job role clarity", "employee hierarchy", "organizational structure", "position awareness", "job responsibilities", "reporting lines", "role definition", "job title understanding", "departmental alignment", "position description", "team dynamics", "role expectations", "hierarchical knowledge", "functional hierarchy", "role perception", "job function clarity", "team roles", "reporting hierarchy", "team contribution", "role awareness", "department relationships", "role visibility", "organizational chart", "functional responsibilities", "role accountability", "team collaboration", "role communication", "cross-functional awareness", "role significance", "role differentiation", "team structure", "role alignment", "position context", "departmental interactions", "role integration", "role recognition", "team cooperation", "role differentiation", "hierarchical understanding", "position impact", "team hierarchy", "role contribution", "role identity", "team interdependence", "role empowerment", "role engagement", "team synergy", "position relevance", "role collaboration", "team cohesion", "understanding of the employee's role within the company", "employee's position comprehension within the organization", "awareness of the employee's place in the company", "employee's role understanding within the firm", "employee's position awareness within the organization", "employee's role", "employee role", "employees role"],	Non significatif

Culture	La compréhension du projet de l’ équipe	"understanding_team_project ": ["project scope", "team objectives", "project goals", "task comprehension", "collaborative synergy", "project vision", "team alignment", "task coordination", "project mission", "team dynamics", "task distribution", "project strategy", "team roles", "task interdependence", "project plan", "team collaboration", "task delegation", "project execution", "team communication", "task ownership", "project progress", "team synchronization", "task accountability", "project milestones", "team cooperation", "task visibility", "project timeline", "team interactivity", "task engagement", "project deliverables", "team synergy", "task completion", "project evaluation", "team cohesion", "task accomplishment", "project assessment", "team harmony", "task efficiency", "project performance", "team alignment", "task effectiveness", "project success", "team coordination", "task contribution", "project outcome", "team productivity", "task impact", "project achievement", "team efficiency", "task realization", "project results", "team project", "teams projects", "project understanding", "team project understanding",],	Non significatif

Culture	L’envie de travailler pour l'entreprise	"desire_to_work ": ["employee motivation", "workplace attraction", "job satisfaction", "career aspirations", "employee engagement", "company appeal", "job fulfillment", "professional desire", "work interest", "employee commitment", "company reputation", "job enthusiasm", "career prospects", "employee dedication", "company culture fit", "job contentment", "professional ambition", "workplace allure", "employee loyalty", "company values alignment", "job passion", "career growth", "employee attachment", "company mission alignment", "job fulfillment", "professional drive", "workplace desirability", "employee pride", "company vision alignment", "job contentment", "career motivation", "employee satisfaction", "company purpose alignment", "job engagement", "career dedication", "employee intent", "company identity fit", "job motivation", "professional loyalty", "employee aspiration", "company philosophy alignment", "job happiness", "career satisfaction", "employee eagerness", "company ethos fit", "job loyalty", "professional commitment", "workplace aspiration", "company principles alignment", "job dedication", "career enthusiasm", "motivation"", "motivate"", "motivations", "motivates"", "employee motivation", "employees motivation"],	0,165954729

Culture	La rétention d'employé	"employee_retention ": ["talent preservation", "staff longevity", "workforce stability", "employee turnover", "staff retention", "workplace retention", "workforce retention", "staff consistency", "workplace consistency", "talent stability", "staff permanence", "workplace permanence", "workforce permanence", "talent longevity", "staff loyalty", "workplace loyalty", "workforce loyalty", "staff commitment", "workplace commitment", "workforce commitment", "talent commitment", "staff dedication", "workplace dedication", "workforce dedication", "talent dedication", "staff retention strategies", "workplace retention strategies", "workforce retention strategies", "talent retention strategies", "staff turnover reduction", "workplace turnover reduction", "workforce turnover reduction", "talent turnover reduction", "employee retention programs", "staff engagement", "workplace engagement", "workforce engagement", "talent engagement", "staff morale", "workplace morale", "workforce morale", "talent morale", "staff job satisfaction", "workplace job satisfaction", "workforce job satisfaction", "talent job satisfaction", "staff well-being", "workplace well-being", "workforce well-being", "talent well-being", "staff career growth", "workplace career growth", "workforce career growth", "talent career growth", "employee satisfaction"", "employees satisfaction"", "employee satisfactions"", "employee satisafactions"],	Non significatif

Culture	La cohésion d'équipe	"team_cohesion ": ["collaborative unity", "group harmony", "team integration", "mutual support", "collective synergy", "group cooperation", "team collaboration", "mutual trust", "collective alignment", "group coordination", "team cohesion", "mutual understanding", "collective solidarity", "group rapport", "team spirit", "mutual respect", "collective teamwork", "group collaboration", "team unity", "mutual empathy", "collective cohesiveness", "group camaraderie", "team harmony", "mutual communication", "collective collaboration", "group cohesion", "team synchronization", "mutual synergy", "collective integration", "group teamwork", "team integration strategies", "mutual bond", "collective alignment strategies", "group collaboration strategies", "team cohesion strategies", "mutual support mechanisms", "collective trust-building", "group cooperation methods", "team-building activities", "mutual understanding approaches", "collective solidarity initiatives", "group bonding exercises", "team-building workshops", "mutual respect guidelines", "collective communication practices", "group harmony techniques", "team cohesion efforts", "mutual synergy approaches", "collective alignment practices", "group coordination methods", "team collaboration strategies", "mutual empathy practices", "collective cohesiveness tactics", "group teamwork methods", "team spirit", "teams spirits", "team spirits", "team cohesion", "teams cohesion", "team collaboration", "teams collaboration"],	Non significatif

Culture	L’apprentissage vis-à-vis des tâches à faire	"learning_tasks ": ["task understanding", "job comprehension", "work assignment clarity", "task awareness", "duties perception", "task clarification", "job understanding", "work responsibilities knowledge", "task scope grasp", "duties recognition", "task complexity comprehension", "job requirements understanding", "work tasks familiarity", "task expectations clarity", "duties specifications awareness", "task objectives recognition", "job tasks grasp", "workload understanding", "task details comprehension", "duties intricacies awareness", "task responsibilities recognition", "job duties clarity", "workload breakdown comprehension", "task goals understanding", "duties components awareness", "task functions recognition", "job responsibilities grasp", "work tasks breakdown comprehension", "task role understanding", "duties elements awareness", "task role recognition", "job roles and tasks knowledge", "work assignments grasp", "task responsibilities comprehension", "duties duties awareness", "task duties recognition", "job tasks and responsibilities understanding", "work roles and tasks knowledge", "task workload comprehension", "duties responsibilities awareness", "task workload recognition", "job workload understanding", "work responsibilities breakdown comprehension", "task workload understanding", "duties workload awareness", "task complexity recognition", "job duties and tasks knowledge", "work tasks and responsibilities comprehension", "task intricacies understanding", "duties components recognition", "task functions comprehension", "work improvement"", "work improvements", "improve the quality of work", "improving the quality of work", "improving performance", "improve performance", "improves performance"],	Non significatif

Culture	L’apprentissage vis-à-vis des skills à avoir	"learning_skills ": ["skill understanding", "competence comprehension", "capability awareness", "skillset clarification", "talent understanding", "expertise recognition", "proficiency comprehension", "competency knowledge", "skill proficiency grasp", "capability recognition", "skillset familiarity", "expertise awareness", "proficiency understanding", "competency grasp", "skill competency recognition", "capability proficiency knowledge", "skillset expertise grasp", "expertise proficiency recognition", "proficiency competency comprehension", "competency proficiency grasp", "skill competency familiarity", "capability expertise recognition", "skillset proficiency awareness", "expertise competency knowledge", "proficiency skill grasp", "competency capability understanding", "skill competency comprehension", "capability proficiency recognition", "skillset competency grasp", "expertise proficiency comprehension", "proficiency competency recognition", "competency proficiency familiarity", "skill capability understanding", "capability proficiency comprehension", "skillset expertise recognition", "expertise proficiency grasp", "proficiency competency familiarity", "competency proficiency knowledge", "skill competency grasp", "capability competency recognition", "skillset proficiency comprehension", "expertise competency familiarity", "proficiency skill recognition", "competency capability comprehension", "skill competency awareness", "capability proficiency familiarity", "skillset expertise knowledge", "expertise proficiency familiarity", "proficiency competency awareness", "competency proficiency comprehension", "skill capability recognition", "capability proficiency awareness", "skillset competency familiarity", "expertise proficiency knowledge", "proficiency skill comprehension", "skills improvement", "skill improvement", "skills improvements", "skills improvement"],	Non significatif

Culture	Fréquence et utilité de réunions	"meeting_frequency ": ["meeting occurrence", "gathering frequency", "session regularity", "conference consistency", "assemblage interval", "discussion regularity", "meetup cadence", "convening rate", "session frequency", "meeting schedule", "gathering frequency patterns", "session occurrence trends", "conference regularity trends", "assemblage interval analysis", "discussion frequency changes", "meetup cadence variations", "convening rate fluctuations", "session frequency shifts", "meeting schedule adjustments", "meeting frequency optimization", "gathering regularity enhancement", "session consistency improvement", "conference occurrence refinement", "assemblage frequency enhancement", "discussion regularity improvement", "meetup cadence enhancement", "convening rate refinement", "session frequency enhancement", "meeting schedule improvement", "meeting frequency trends", "gathering regularity patterns", "session consistency trends", "conference occurrence patterns", "assemblage frequency analysis", "discussion regularity changes", "meetup cadence variations", "convening rate fluctuations", "session frequency shifts", "meeting schedule adjustments", "meeting frequency assessment", "gathering regularity evaluation", "session consistency analysis", "conference occurrence evaluation", "assemblage frequency assessment", "discussion regularity analysis", "meetup cadence evaluation", "convening rate analysis", "session frequency evaluation", "meeting schedule analysis", "meeting frequency optimization strategies", "gathering regularity enhancement approaches", "session consistency improvement methods", "meeting"", "meetings"", "sessions", "frequence of meetings", "occurrences of meetings", "use of meetings", "goals of meetings"],	0,443886342

Culture		"meeting_usefulness ": ["meeting value", "gathering utility", "session effectiveness", "conference usefulness", "assemblage benefit", "discussion advantage", "meetup relevance", "convening importance", "session significance", "meeting impact", "gathering contribution", "session value analysis", "conference utility assessment", "assemblage effectiveness evaluation", "discussion usefulness analysis", "meetup benefit evaluation", "convening advantage analysis", "session relevance assessment", "meeting importance analysis", "meeting impact evaluation", "gathering contribution analysis", "session value optimization", "conference utility enhancement", "assemblage effectiveness improvement", "discussion usefulness optimization", "meetup benefit enhancement", "convening advantage improvement", "session relevance optimization", "meeting importance improvement", "meeting impact optimization", "gathering contribution enhancement", "session value enhancement approaches", "conference utility improvement methods", "assemblage effectiveness enhancement approaches", "discussion usefulness improvement methods", "meetup benefit enhancement methods", "convening advantage enhancement methods", "session relevance improvement methods", "meeting importance enhancement methods", "meeting impact enhancement methods", "gathering contribution improvement methods", "session value enhancement strategies", "conference utility optimization strategies", "assemblage effectiveness evaluation strategies", "discussion usefulness analysis strategies", "meetup benefit evaluation strategies", "convening advantage analysis strategies", "session relevance assessment strategies", "meeting importance analysis strategies", "meeting impact evaluation strategies,],	0,443886342

KPI clients	La satisfaction des clients liés aux produits proposés par l'entreprise	"customer_satisfaction ": ["client contentment", "consumer fulfillment", "customer happiness", "client satisfaction", "consumer pleasure", "customer approval", "client delight", "consumer gratification", "customer contentment evaluation", "client fulfillment assessment", "consumer happiness analysis", "customer satisfaction rating", "client pleasure score", "consumer approval measurement", "customer delight feedback", "client gratification metrics", "consumer contentment level", "customer fulfillment scale", "client happiness index", "consumer satisfaction level", "customer approval rating", "client delight score", "consumer gratification measurement", "customer contentment index", "client fulfillment score", "consumer happiness rating", "customer satisfaction assessment", "client pleasure evaluation", "consumer approval analysis", "customer delight assessment", "client gratification evaluation", "consumer contentment analysis", "customer fulfillment assessment", "client happiness measurement", "consumer satisfaction rating", "customer approval score", "client delight measurement", "consumer gratification level", "customer contentment scale", "client fulfillment index", "consumer happiness index", "customer satisfaction scale", "client pleasure scale", "consumer approval index", "customer delight scale", "client gratification rating", "consumer contentment rating", "customer fulfillment rating", "client happiness evaluation", "consumer satisfaction assessment", "customer approval evaluation", "client delight analysis", "consumer gratification assessment", "customers value"", "customers values"", "customer value"", "customer values", "customer satisfaction", "customer satisfactions", "customers satisfaction", "customers satisfactions"],	Non significatif

KPI opérationnel	Le chiffre d'affaire	"turnover ": ["workforce turnover", "staff attrition", "employee churn", "workplace turnover rate", "employee departure", "staff turnover rate", "workforce attrition", "employee turnover ratio", "staff turnover ratio", "workplace churn", "employee retention challenges", "staff turnover challenges", "workforce attrition issues", "employee churn analysis", "staff departure trends", "workplace turnover patterns", "employee turnover rate", "staff turnover rate trends", "workforce attrition trends", "employee churn patterns", "staff departure analysis", "workplace turnover evaluation", "employee turnover assessment", "staff turnover assessment", "workforce attrition evaluation", "employee churn assessment", "staff departure evaluation", "workplace turnover measurement", "employee turnover measurement", "staff turnover measurement", "workforce attrition measurement", "employee churn measurement", "staff departure measurement", "workplace turnover analysis", "employee turnover analysis", "staff turnover analysis", "workforce attrition analysis", "employee churn trends", "staff departure trends", "workplace turnover evaluation", "employee turnover assessment", "staff turnover assessment", "workforce attrition evaluation", "employee churn assessment", "staff departure evaluation", "workplace turnover measurement", "employee turnover measurement", "staff turnover measurement", "workforce attrition measurement", "employee churn measurement", "staff departure measurement", "workplace turnover optimization strategies", "employee turnover reduction methods", "staff turnover minimization approaches", "workforce attrition prevention strategies", "revenue", "income", "sales", "turnover", "earnings"],	0,327122355

KPI opérationnel	Le volume d'employés	"number_employees ": ["workforce size", "staff count", "employee number", "personnel quantity", "team members total", "workplace manpower", "staff headcount", "employee population", "personnel size", "team members count", "workforce quantity", "staff number trends", "employee count analysis", "personnel size variations", "team members total analysis", "workplace manpower patterns", "staff headcount evaluation", "employee population assessment", "personnel size evaluation", "team members count measurement", "workforce quantity analysis", "staff number trends measurement", "employee count analysis", "personnel size variations measurement", "team members total analysis", "workplace manpower patterns measurement", "staff headcount evaluation", "employee population assessment", "personnel size evaluation", "team members count measurement", "workforce quantity analysis", "staff number optimization", "employee count reduction", "personnel size minimization", "team members downsizing", "workplace manpower reduction", "staff headcount optimization", "employee population downsizing", "personnel size reduction", "team members workforce optimization", "workforce quantity reduction", "staff number reduction strategies", "employee count minimization methods", "personnel size downsizing approaches", "team members downsizing methods", "workplace manpower reduction strategies", "staff headcount minimization approaches", "employee population downsizing methods", "personnel size reduction strategies", "team members workforce downsizing approaches", "workforce quantity reduction strategies", "staff number optimization strategies", "employee count reduction methods", "personnel size downsizing approaches", "team members downsizing methods", "workplace manpower reduction strategies", "staff headcount minimization approaches", "employee population downsizing methods", "personnel size reduction strategies", "team members workforce downsizing strategies", "workforce quantity reduction strategies", "number of employees", "employee count", "workforce size", "staff strength", "total employees"],	Non significatif

KPI opérationnel	Le nombre de client	"customer_volume ": ["client base size", "consumer quantity", "customer numbers", "client volume", "consumer count", "customer base volume", "client quantity", "consumer volume trends", "customer numbers analysis", "client volume variations", "consumer count analysis", "customer base volume patterns", "client quantity evaluation", "consumer volume assessment", "customer numbers measurement", "client volume measurement", "consumer count measurement", "customer base volume measurement", "client quantity analysis", "consumer volume trends measurement", "customer numbers analysis", "client volume variations measurement", "consumer count variations measurement", "customer base volume analysis", "client quantity optimization", "consumer volume reduction", "customer numbers minimization", "client volume downsizing", "consumer count reduction", "customer base volume reduction", "client quantity downsizing", "consumer volume reduction strategies", "customer numbers downsizing strategies", "client volume downsizing approaches", "consumer count downsizing methods", "customer base volume downsizing methods", "client quantity reduction strategies", "consumer volume optimization strategies", "customer numbers optimization strategies", "client volume minimization approaches", "consumer count downsizing strategies", "customer base volume reduction strategies", "client quantity downsizing approaches", "consumer volume optimization strategies", "customer numbers optimization strategies", "client volume minimization approaches", "consumer count downsizing strategies", "customer base volume downsizing strategies", "client quantity downsizing approaches", "number of clients", "client count", "customer base", "total clients", "client quantity"],	Non significatif

Leadership	Le nombre de conflits	"team_conflicts ": ["internal team disputes", "team disagreement instances", "conflicts among team members", "team contention occurrences", "internal team clashes", "team strife cases", "conflicts within the team", "team disagreement situations", "internal team confrontations", "team strife incidents", "conflicts among team members trends", "team contention patterns", "internal team clashes analysis", "team strife evaluation", "conflicts within the team measurement", "team disagreement assessment", "internal team confrontations measurement", "team strife measurement", "conflicts among team members analysis", "team contention trends", "internal team clashes optimization", "team strife minimization", "conflicts within the team downsizing", "team disagreement reduction", "internal team confrontations downsizing", "team strife downsizing", "conflicts among team members downsizing strategies", "team contention downsizing methods", "internal team clashes reduction strategies", "team strife downsizing approaches", "conflicts within the team reduction strategies", "team disagreement optimization strategies", "internal team confrontations minimization approaches", "team strife downsizing strategies", "conflicts among team members downsizing approaches", "team contention reduction strategies", "internal team clashes optimization strategies", "team strife minimization methods", "conflicts within the team downsizing methods", "team disagreement downsizing strategies", "internal team confrontations optimization strategies", "team strife reduction methods", "conflicts among team members optimization strategies", "team contention minimization methods", "internal team clashes downsizing strategies", "team strife downsizing methods", "conflicts within the team optimization strategies", "conflict"", "conflicts"", "number of conflicts", "frequence of conflicts", "occurrences of conflicts", "occurrence of conflicts"],	0,11021748

Leadership		"inter_team_conflicts ": ["team-to-team disputes", "inter-departmental clashes", "conflicts between different teams", "departmental confrontations", "team-to-team disagreements", "inter-departmental disputes", "conflicts across teams", "departmental clashes", "team-toteam contention", "inter-departmental disagreements", "conflicts between different teams trends", "departmental contention patterns", "team-to-team clashes analysis", "inter-departmental strife evaluation", "conflicts across teams measurement", "departmental disagreement assessment", "team-to-team confrontation measurement", "inter-departmental strife measurement", "conflicts between different teams analysis", "departmental contention trends", "team-to-team disputes optimization", "inter-departmental clashes minimization", "conflicts across teams downsizing", "departmental confrontation reduction", "team-to-team contention downsizing", "inter-departmental disagreements reduction", "conflicts between different teams downsizing strategies", "departmental contention downsizing methods", "team-to-team disputes reduction strategies", "inter-departmental clashes downsizing approaches", "conflicts across teams reduction strategies", "departmental disagreement optimization strategies", "team-to-team confrontation minimization approaches", "inter-departmental strife downsizing strategies", "conflicts between different teams downsizing approaches", "departmental contention optimization strategies", "team-to-team disputes minimization approaches", "inter-departmental clashes downsizing methods", "conflicts across teams optimization strategies", "departmental confrontation downsizing methods", "team-to-team contention optimization strategies", "inter-departmental disagreements downsizing strategies", "conflicts between different teams downsizing methods", "departmental contention downsizing strategies", "team-toteam disputes downsizing methods", "inter-departmental clashes optimization strategies", "conflicts across teams downsizing strategies", "departmental disagreement downsizing methods", "teamto-team confrontation downsizing strategies,],	0,11021748

Leadership		"manager_conflicts ": ["supervisor clashes", "managerial disputes", "conflicts with managers", "boss confrontation instances", "supervisor disagreements", "managerial clashes", "conflicts with bosses", "boss strife cases", "supervisor conflicts", "managerial contention occurrences", "conflicts with managers trends", "boss contention patterns", "supervisor clashes analysis", "managerial strife evaluation", "conflicts with bosses measurement", "boss conflicts assessment", "supervisor confrontations measurement", "managerial strife measurement", "conflicts with managers analysis", "boss contention trends", "supervisor conflicts optimization", "managerial contention minimization", "conflicts with bosses downsizing", "boss confrontation reduction", "supervisor disputes downsizing", "managerial clashes downsizing", "conflicts with managers reduction strategies", "boss strife downsizing methods", "supervisor clashes reduction strategies", "managerial conflicts downsizing approaches", "conflicts with bosses downsizing strategies", "boss confrontation downsizing approaches", "supervisor disputes optimization strategies", "managerial clashes minimization approaches", "conflicts with managers downsizing methods", "boss strife optimization strategies", "supervisor clashes downsizing strategies", "managerial conflicts optimization strategies", "conflicts with bosses optimization strategies", "boss confrontation minimization approaches", "supervisor disputes downsizing methods", "managerial clashes downsizing strategies", "conflicts with managers downsizing approaches", "boss strife downsizing methods", "supervisor clashes optimization strategies", "managerial conflicts minimization methods", "conflicts with bosses downsizing strategies", "boss confrontation downsizing methods", "supervisor disputes optimization strategies,],	0,11021748

Leadership	La satisfaction liée à la gestion RH de l'entreprise	"satisfaction_direct_manager ": ["contentment with immediate supervisor", "approval of direct manager", "satisfaction with direct boss", "happiness with supervisor", "satisfaction with manager", "approval of immediate supervisor", "contentment with direct boss", "happiness with direct manager", "satisfaction with immediate supervisor", "approval of direct boss", "contentment with supervisor", "happiness with manager", "satisfaction with direct supervisor", "approval of supervisor", "contentment with direct manager", "happiness with immediate supervisor", "satisfaction with boss", "approval of manager", "contentment with manager", "happiness with direct boss", "satisfaction with supervisor performance", "approval of direct manager behavior", "contentment with direct supervisor approach", "happiness with boss management", "satisfaction with immediate boss attitude", "approval of manager leadership", "contentment with supervisor style", "happiness with direct manager effectiveness", "satisfaction with direct boss behavior", "approval of immediate supervisor approach", "contentment with boss style", "happiness with manager performance", "satisfaction with direct supervisor leadership", "approval of supervisor attitude", "contentment with direct manager behavior", "happiness with direct boss management", "satisfaction with immediate boss leadership", "approval of manager style", "contentment with supervisor performance", "happiness with direct manager attitude", "satisfaction with boss effectiveness", "approval of immediate supervisor behavior", "contentment with manager attitude", "happiness with supervisor leadership", "satisfaction with direct boss style", "approval of direct manager performance", "contentment with direct supervisor attitude", "happiness with manager approach", "HR leadership"", "HR leaderships"],	Non significatif

Leadership	La satisfaction liée à la gestion de son manager direct	"satisfaction_global_management ": ["overall company management satisfaction", "global management contentment", "entire company management approval", "satisfaction with company leadership", "approval of company management", "company-wide management satisfaction", "global management happiness", "entire company management contentment", "satisfaction with corporate leadership", "approval of company leadership", "company-wide management approval", "global management satisfaction level", "entire company management happiness", "satisfaction with organization leadership", "approval of corporate management", "company-wide management contentment", "global management approval rating", "entire company management satisfaction level", "satisfaction with enterprise leadership", "approval of organization management", "company-wide management approval rating", "global management contentment level", "entire company management approval rating", "satisfaction with business leadership", "approval of enterprise management", "company-wide management satisfaction level assessment", "global management happiness level", "entire company management contentment level", "satisfaction with management at the company", "approval of business leadership", "company-wide management approval level", "global management satisfaction assessment", "entire company management approval level", "satisfaction with management practices", "approval of company management style", "company-wide management contentment assessment", "global management approval level", "entire company management satisfaction assessment", "satisfaction with company management approach", "approval of management principles", "company-wide management approval assessment", "global management contentment level assessment", "entire company management happiness level", "satisfaction with company management style", "approval of management strategies", "company-wide management satisfaction assessment", "global management approval assessment", "team leadership"", "teams leadership"],	Non significatif

Leadership	La satisfaction liée à la gestion de l'entreprise de manière globale	"satisfaction_personnel_management ": ["personnel management satisfaction", "staff management contentment", "employee management approval", "satisfaction with workforce management", "approval of personnel management", "staff management satisfaction", "employee management happiness", "personnel management contentment", "satisfaction with staff management", "approval of employee management", "workforce management satisfaction", "staff management approval", "personnel management happiness", "satisfaction with personnel management", "approval of workforce management", "employee management satisfaction level", "staff management happiness", "personnel management approval", "satisfaction with employee management", "approval of staff management", "workforce management contentment", "personnel management satisfaction level", "staff management approval rating", "employee management contentment", "satisfaction with workforce management practices", "approval of personnel management approach", "staff management satisfaction assessment", "employee management approval level", "personnel management contentment level", "satisfaction with staff management style", "approval of workforce management strategies", "employee management satisfaction assessment", "staff management approval assessment", "personnel management happiness level", "satisfaction with employee management approach", "approval of staff management style", "workforce management satisfaction level assessment", "employee management contentment level assessment", "staff management happiness level", "personnel management approval assessment", "satisfaction with workforce management style", "approval of personnel management principles", "employee management satisfaction level assessment", "staff management satisfaction level", "personnel management approval level", "satisfaction with employee management style", "approval of staff management strategies", "workforce management contentment assessment", "employee management satisfaction assessment", "organizational leadership", "organizational leaderships", "company leadership", "company leaderships", "Top-level management"],	Non significatif

Leadership	Les discriminations dans l’entreprise	"discrimination_in_company ": ["company discrimination incidents", "discrimination within the organization", "workplace bias occurrences", "company prejudice instances", "discrimination incidents analysis", "organizational bias patterns", "workplace prejudice cases", "company discrimination trends", "discrimination within the firm analysis", "workplace bias patterns", "organizational prejudice trends", "company discrimination analysis", "discrimination incidents assessment", "workplace bias assessment", "organizational prejudice analysis", "company discrimination assessment", "discrimination within the organization evaluation", "workplace bias evaluation", "organizational prejudice assessment", "company discrimination incidents evaluation", "discrimination within the firm evaluation", "workplace bias incidents evaluation", "organizational prejudice instances evaluation", "company discrimination incidents assessment", "discrimination within the organization assessment", "workplace bias occurrences assessment", "organizational prejudice incidents assessment", "company discrimination incidents analysis", "discrimination within the firm analysis", "workplace bias patterns analysis", "organizational prejudice trends analysis", "company discrimination trends analysis", "discrimination within the organization trends analysis", "workplace bias assessment analysis", "organizational prejudice assessment analysis", "company discrimination assessment analysis", "discrimination within the firm assessment analysis", "workplace bias evaluation analysis", "organizational prejudice evaluation analysis", "company discrimination incidents evaluation analysis", "discrimination within the organization incidents evaluation analysis", "workplace bias occurrences evaluation analysis", "organizational prejudice instances evaluation analysis", "company discrimination incidents assessment analysis", "discrimination within the firm assessment analysis", "workplace bias patterns assessment analysis", "organizational prejudice trends assessment analysis", "discrimination", "bias", "prejudice", "inequality", "unfair treatment", "discriminations", "prejudices", "inequalities", "unfair treatments"],	0,157881863

Leadership	L'utilité et fréquences des feedbacks	"usefulness_of_feedback ": ["feedback effectiveness", "value of feedback", "utility of feedback", "benefits of feedback", "feedback contribution", "feedback significance", "feedback impact", "feedback advantages", "usefulness of input", "benefits of input", "value of input", "input effectiveness", "input contribution", "input significance", "input impact", "input advantages", "usefulness of critique", "benefits of critique", "value of critique", "critique effectiveness", "critique contribution", "critique significance", "critique impact", "critique advantages", "usefulness of assessment", "benefits of assessment", "value of assessment", "assessment effectiveness", "assessment contribution", "assessment significance", "assessment impact", "assessment advantages", "usefulness of reaction", "benefits of reaction", "value of reaction", "reaction effectiveness", "reaction contribution", "reaction significance", "reaction impact", "reaction advantages", "usefulness of commentary", "benefits of commentary", "value of commentary", "commentary effectiveness", "commentary contribution", "commentary significance", "commentary impact", "commentary advantages", "usefulness of response", "benefits of response", "value of response", "response effectiveness", "response contribution", "feedback", "feedbacks"", "use of feedbacks", "uses of feedbacks", "use of feedback", "uses of feedback", "frequence of feedbacks", "occurrence of feedbacks", "employees feedbacks", "employee feedbacks"],	0,309863828

Leadership		"feedback_frequency ": ["feedback occurrence rate", "feedback frequency level", "frequency of input", "rate of feedback provision", "feedback frequency pattern", "input occurrence frequency", "rate of input sharing", "input feedback frequency", "frequency of critique", "rate of critique delivery", "critique frequency level", "frequency of assessment", "rate of assessment sharing", "assessment feedback frequency", "frequency of reaction", "rate of reaction provision", "reaction frequency pattern", "frequency of commentary", "rate of commentary delivery", "commentary frequency level", "frequency of response", "rate of response sharing", "response feedback frequency", "feedback occurrence rate assessment", "feedback frequency level assessment", "frequency of input assessment", "rate of feedback provision assessment", "feedback frequency pattern assessment", "input occurrence frequency assessment", "rate of input sharing assessment", "input feedback frequency assessment", "frequency of critique assessment", "rate of critique delivery assessment", "critique frequency level assessment", "frequency of assessment assessment", "rate of assessment sharing assessment", "assessment feedback frequency assessment", "frequency of reaction assessment", "rate of reaction provision assessment", "reaction frequency pattern assessment", "frequency of commentary assessment", "rate of commentary delivery assessment", "commentary frequency level assessment", "frequency of response assessment", "rate of response sharing assessment", "response feedback frequency assessment", "feedback occurrence rate evaluation", "feedback frequency level evaluation,],	0,309863828

Organisation	Le lieu de travail	"workplace_attractiveness ": ["workplace allure", "office appeal", "work environment desirability", "workplace charm", "office magnetism", "work environment attractiveness", "workplace attraction", "office attractiveness", "work environment allure", "workplace appeal", "office desirability", "work environment magnetism", "workplace desirability", "office allure", "work environment appeal", "workplace magnetism", "office attraction", "work environment charm", "workplace desirability assessment", "office allure assessment", "work environment magnetism assessment", "workplace appeal assessment", "office desirability assessment", "work environment allure assessment", "workplace charm assessment", "office attractiveness assessment", "work environment attraction assessment", "workplace appeal evaluation", "office magnetism evaluation", "work environment desirability evaluation", "workplace charm evaluation", "office attractiveness evaluation", "work environment attraction evaluation", "workplace magnetism evaluation", "office charm", "work environment attraction", "workplace allure analysis", "office appeal analysis", "work environment desirability analysis", "workplace charm analysis", "office magnetism analysis", "work environment attractiveness analysis", "workplace attraction analysis", "office attractiveness analysis", "work environment allure analysis", "workplace appeal analysis", "office desirability analysis", "work environment magnetism analysis", "workplace desirability analysis", "office allure analysis", "work environment appeal analysis", "Workplace attractiveness", "appeal of the workplace", "workplace desirability", "workplace allure", "workplace charm"", "workplace performance", "performance at the workplace", "workplace-related performance", "workplace effectiveness", "workplace productivity", "workplaces performances", "workplace performances",physical well-being at the workplace, "workplace physical health", "physical wellness during work", "occupational physical well-being", "work-related physical fitness"", "workplace adaptability", "office flexibility", "workplace adjustment", "workplace flexibility", "work environment adaptability"", "workplace adaptabilities"", "workplace flexbility", "workplace flexibilities", "workplace", "workplaces", "work environment", "work environments"],	0,224618361

Organisation		"workplace_performance ": ["workplace efficiency", "office effectiveness", "work environment productivity", "workplace output", "office performance", "work environment efficiency", "workplace productivity", "office output", "work environment effectiveness", "workplace performance assessment", "office efficiency assessment", "work environment productivity assessment", "workplace output assessment", "office performance assessment", "work environment efficiency assessment", "workplace productivity assessment", "office output assessment", "work environment effectiveness assessment", "workplace performance evaluation", "office efficiency evaluation", "work environment productivity evaluation", "workplace output evaluation", "office performance evaluation", "work environment efficiency evaluation", "workplace productivity evaluation", "office output evaluation", "work environment effectiveness evaluation", "workplace performance analysis", "office efficiency analysis", "work environment productivity analysis", "workplace output analysis", "office performance analysis", "work environment efficiency analysis", "workplace productivity analysis", "office output analysis", "work environment effectiveness analysis", "workplace performance optimization", "office efficiency optimization", "work environment productivity optimization", "workplace output optimization", "office performance optimization", "work environment efficiency optimization", "workplace productivity optimization", "office output optimization", "work environment effectiveness optimization", "workplace performance improvement", "office efficiency improvement", "work environment productivity improvement", "workplace output improvement", "office performance improvement", "work environment efficiency improvement,],	0,224618361

Organisation		"workplace_adaptability ": ["workplace flexibility", "office adjustability", "work environment versatility", "workplace modification", "office adaptiveness", "work environment flexibility", "workplace versatility", "office modification", "work environment adaptability", "workplace adaptiveness", "office flexibility", "work environment adjustability", "workplace adaptability assessment", "office adaptiveness assessment", "work environment flexibility assessment", "workplace modification assessment", "office versatility assessment", "work environment adjustability assessment", "workplace adaptability evaluation", "office adaptiveness evaluation", "work environment flexibility evaluation", "workplace modification evaluation", "office versatility evaluation", "work environment adjustability evaluation", "workplace adaptability analysis", "office adaptiveness analysis", "work environment flexibility analysis", "workplace modification analysis", "office versatility analysis", "work environment adjustability analysis", "workplace adaptability optimization", "office adaptiveness optimization", "work environment flexibility optimization", "workplace modification optimization", "office versatility optimization", "work environment adjustability optimization", "workplace adaptability improvement", "office adaptiveness improvement", "work environment flexibility improvement", "workplace modification improvement", "office versatility improvement", "work environment adjustability improvement", "workplace adaptability enhancement", "office adaptiveness enhancement", "work environment flexibility enhancement", "workplace modification enhancement", "office versatility enhancement", "work environment adjustability enhancement", "workplace adaptability advancement", "office adaptiveness advancement", "work environment flexibility advancement", "workplace modification advancement", "office versatility advancement", "work environment adjustability advancement,],	0,224618361

Organisation		"team_knowledge_sharing ": ["team information exchange", "knowledge transfer within the team", "collaborative learning in the team", "team knowledge dissemination", "team knowledge sharing process", "information flow within the team", "knowledge distribution in the team", "team learning exchange", "team information diffusion", "team knowledge collaboration", "knowledge sharing practices within the team", "information dissemination in the team", "collaborative learning within the team", "team knowledge flow", "team knowledge transmission", "knowledge sharing dynamics in the team", "information sharing within the team", "team knowledge propagation", "team knowledge diffusion", "knowledge exchange within the team", "team information flow", "knowledge distribution within the team", "team learning dynamics", "team information propagation", "team knowledge diffusion analysis", "knowledge sharing within the team analysis", "collaborative learning in the team analysis", "team knowledge dissemination assessment", "team knowledge sharing process evaluation", "information flow within the team analysis", "knowledge distribution in the team assessment", "team learning exchange analysis", "team information diffusion evaluation", "team knowledge collaboration assessment", "knowledge sharing practices within the team analysis", "information dissemination in the team assessment", "collaborative learning within the team analysis", "team knowledge flow evaluation", "team knowledge transmission analysis", "knowledge sharing dynamics in the team assessment", "information sharing within the team analysis", "team knowledge propagation evaluation", "team knowledge diffusion evaluation", "knowledge exchange within the team analysis", "team information flow evaluation", "knowledge distribution within the team analysis,],	0,224618361

Organisation	Le partage de connaissance	"external_knowledge_sharing ": ["external information exchange", "knowledge transfer outside the team", "collaborative learning beyond the team", "external knowledge dissemination", "knowledge sharing beyond the team", "external information flow", "knowledge distribution outside the team", "external learning exchange", "external information diffusion", "external knowledge collaboration", "knowledge sharing practices outside the team", "external information propagation", "collaborative learning outside the team", "external knowledge flow", "external knowledge transmission", "knowledge sharing dynamics outside the team", "external information sharing", "external knowledge propagation", "external knowledge diffusion", "knowledge exchange outside the team", "external information flow analysis", "knowledge distribution outside the team analysis", "external learning dynamics", "external information propagation analysis", "collaborative learning outside the team analysis", "external knowledge flow evaluation", "external knowledge transmission analysis", "knowledge sharing dynamics outside the team analysis", "external information sharing analysis", "external knowledge propagation evaluation", "external knowledge diffusion analysis", "knowledge exchange outside the team evaluation", "external information flow assessment", "knowledge distribution outside the team evaluation", "external learning dynamics analysis", "external information propagation assessment", "collaborative learning outside the team evaluation", "external knowledge flow analysis", "external knowledge transmission evaluation", "knowledge sharing dynamics outside the team evaluation", "external information sharing assessment", "external knowledge propagation analysis", "external knowledge diffusion evaluation", "knowledge exchange outside the team analysis", "external information flow analysis", "knowledge distribution outside the team analysis", "share experience", "share experiences", "share knowledge"", "share knowledges"", "shares experience", "shares experiences", "shares knowledge"", "shares knowledges"", "sharing experience", "sharing experiences", "sharing knowledge"", "sharing knowledges"],	Non significatif

Organisation		"physical_wellbeing_workplace ": ["workplace physical health", "office well-being", "work environment physical fitness", "workplace health and wellness", "office physical well-being", "work environment well-being", "workplace physical comfort", "office health and fitness", "work environment physical well-being", "workplace well-being", "office physical health", "work environment physical comfort", "workplace physical well-being assessment", "office health and wellness assessment", "work environment physical fitness assessment", "workplace well-being evaluation", "office physical wellbeing assessment", "work environment health and fitness assessment", "workplace physical comfort assessment", "office physical well-being evaluation", "work environment well-being assessment", "workplace physical health analysis", "office health and wellness analysis", "work environment physical fitness analysis", "workplace well-being analysis", "office physical well-being analysis", "work environment health and fitness analysis", "workplace physical comfort analysis", "office physical well-being optimization", "work environment wellbeing optimization", "workplace physical comfort optimization", "office health and wellness optimization", "work environment physical fitness optimization", "workplace well-being optimization", "office physical health optimization", "work environment health and fitness optimization", "workplace physical well-being improvement", "office physical well-being improvement", "work environment well-being improvement", "office health and wellness improvement", "work environment physical fitness improvement", "workplace physical comfort improvement", "office physical well-being enhancement", "work environment well-being enhancement", "workplace physical comfort enhancement", "office health and wellness enhancement", "work environment physical fitness enhancement", "workplace wellbeing enhancement", "office physical health enhancement", "work environment health and fitness enhancement,],	Non significatif

Organisation	La communication	"communication_ease_workplace ": ["workplace communication simplicity", "office communication ease", "work environment communication convenience", "communication fluidity in the workplace", "office communication comfort", "work environment communication smoothness", "workplace communication accessibility", "office communication fluency", "work environment communication simplicity", "communication ease within the workplace", "office communication accessibility", "work environment communication fluency", "workplace communication fluidity", "office communication simplicity", "work environment communication accessibility", "workplace communication smoothness", "office communication ease assessment", "work environment communication comfort assessment", "communication fluidity in the workplace evaluation", "office communication fluency assessment", "work environment communication simplicity evaluation", "workplace communication accessibility assessment", "office communication accessibility evaluation", "work environment communication fluency evaluation", "workplace communication fluidity assessment", "office communication simplicity evaluation", "work environment communication accessibility evaluation", "workplace communication smoothness evaluation", "office communication ease analysis", "work environment communication comfort analysis", "communication fluidity in the workplace analysis", "office communication fluency analysis", "work environment communication simplicity analysis", "workplace communication accessibility analysis", "office communication accessibility analysis", "work environment communication fluency analysis", "workplace communication fluidity analysis", "office communication simplicity analysis", "work environment communication accessibility analysis", "workplace communication smoothness analysis", "office communication ease optimization", "work environment communication comfort optimization", "communication fluidity in the workplace optimization", "office communication fluency optimization", "work environment communication simplicity optimization", "workplace communication accessibility optimization", "office communication accessibility optimization", "work environment communication fluency optimization", "workplace communication fluidity	1,030469106

		optimization", "office communication simplicity optimization", "work environment communication accessibility optimization",	

		"communication at workplace"", "workplace communication"", "manager communication"", "managers communication"", "communicate with the manager"", "communicate with the managers"", "communicate with the leader"", "communicate with the leaders"", "communicates with the manager"", "communicates with the managers"", "communicates with the leader"", "communicates with the leaders", "team communication"", "teams communication"", "communicate with the team"", "communicate with the teams"", "communicate with team"", "communicate with teams"", "communicates with the team"", "communicates with the teams"", "communicates with team"", "communicates with teams"],	

Organisation		"communication_trust_managers ": ["communication with managers trust", "managers communication reliability", "trustworthiness of managers communication", "communication with supervisors confidence", "supervisors communication reliability", "trust in communication with managers", "managers communication credibility", "communication with managers assurance", "managers communication integrity", "supervisors communication trustworthiness", "communication with supervisors belief", "supervisors communication dependability", "trust in communication with supervisors", "supervisors communication credibility", "communication with supervisors reliance", "supervisors communication authenticity", "managers communication trustworthiness assessment", "communication with managers credibility assessment", "managers communication reliability assessment", "communication with supervisors integrity assessment", "supervisors communication trust assessment", "trustworthiness of managers communication evaluation", "communication with managers assurance evaluation", "managers communication reliability evaluation", "communication with supervisors confidence evaluation", "supervisors communication reliability evaluation", "trust in communication with managers analysis", "managers communication credibility analysis", "communication with managers assurance analysis", "managers communication integrity analysis", "supervisors communication trustworthiness analysis", "communication with supervisors belief analysis", "supervisors communication dependability analysis", "trust in communication with supervisors analysis", "supervisors communication credibility analysis", "communication with supervisors reliance analysis", "supervisors communication authenticity analysis", "managers communication trustworthiness optimization", "communication with managers credibility optimization", "managers communication reliability optimization", "communication with supervisors integrity optimization", "supervisors communication trustworthiness optimization", "trustworthiness of managers communication improvement", "communication with managers assurance improvement", "managers communication reliability improvement",	1,030469106

		"communication with supervisors confidence improvement", "supervisors communication reliability improvement", "trust in communication with managers enhancement", "managers	

		communication credibility enhancement", "communication with managers assurance enhancement,],	

Organisation		"communication_ease_team ": ["communication within the team simplicity", "team communication ease", "communication convenience within the team", "communication fluidity with the team", "team communication comfort", "communication smoothness within the team", "communication accessibility within the team", "team communication fluency", "communication simplicity within the team", "communication ease with the team", "communication accessibility with the team", "team communication simplicity", "communication fluency within the team", "communication ease within the team analysis", "communication convenience within the team analysis", "communication fluidity with the team analysis", "team communication comfort analysis", "communication smoothness within the team analysis", "communication accessibility within the team analysis", "team communication fluency analysis", "communication simplicity within the team analysis", "communication ease with the team evaluation", "communication accessibility with the team evaluation", "team communication simplicity evaluation", "communication fluency within the team evaluation", "communication ease within the team optimization", "communication convenience within the team optimization", "communication fluidity with the team optimization", "team communication comfort optimization", "communication smoothness within the team optimization", "communication accessibility within the team optimization", "team communication fluency optimization", "communication simplicity within the team optimization", "communication ease with the team improvement", "communication accessibility with the team improvement", "team communication simplicity improvement", "communication fluency within the team improvement", "communication ease within the team enhancement", "communication convenience within the team enhancement", "communication fluidity with the team enhancement", "team communication comfort enhancement", "communication smoothness within the team enhancement", "communication accessibility within the team enhancement", "team communication fluency enhancement", "communication simplicity within the team enhancement,],	1,030469106

Organisation		"communication_ease_different_team ": ["communication with different team simplicity", "different team communication ease", "communication convenience with another team", "communication fluidity with other teams", "different team communication comfort", "communication smoothness with a different team", "communication accessibility with another team", "different team communication fluency", "communication simplicity with other teams", "communication ease with another team", "communication accessibility with different team", "different team communication simplicity", "communication fluency with other teams", "communication ease with a different team analysis", "communication convenience with another team analysis", "communication fluidity with other teams analysis", "different team communication comfort analysis", "communication smoothness with a different team analysis", "communication accessibility with another team analysis", "different team communication fluency analysis", "communication simplicity with other teams analysis", "communication ease with a different team evaluation", "communication accessibility with different team evaluation", "different team communication simplicity evaluation", "communication fluency with other teams evaluation", "communication ease with a different team optimization", "communication convenience with another team optimization", "communication fluidity with other teams optimization", "different team communication comfort optimization", "communication smoothness with a different team optimization", "communication accessibility with another team optimization", "different team communication fluency optimization", "communication simplicity with other teams optimization", "communication ease with a different team improvement", "communication accessibility with different team improvement", "different team communication simplicity improvement", "communication fluency with other teams improvement", "communication ease with a different team enhancement", "communication convenience with another team enhancement", "communication fluidity with other teams enhancement", "different team communication comfort enhancement", "communication smoothness with a different team enhancement", "communication accessibility with another team enhancement", "different team communication fluency enhancement",	1,030469106

		"communication simplicity with other teams enhancement,],	

Personnes	La diversification dans l'entreprise	"team_diversification ": ["team diversity", "diversity of team members", "team composition variety", "diversified team makeup", "team member heterogeneity", "diversity within the team", "variety of team members", "team member diversification", "team composition diversity", "diversified team structure", "team member variety", "team diversity analysis", "diversity of team members analysis", "team composition variety analysis", "diversified team makeup analysis", "team member heterogeneity analysis", "diversity within the team analysis", "variety of team members analysis", "team member diversification analysis", "team composition diversity analysis", "diversified team structure analysis", "team member variety analysis", "team diversity optimization", "diversity of team members optimization", "team composition variety optimization", "diversified team makeup optimization", "team member heterogeneity optimization", "diversity within the team optimization", "variety of team members optimization", "team member diversification optimization", "team composition diversity optimization", "diversified team structure optimization", "team member variety optimization", "team diversity improvement", "diversity of team members improvement", "team composition variety improvement", "diversified team makeup improvement", "team member heterogeneity improvement", "diversity within the team improvement", "variety of team members improvement", "team member diversification improvement", "team composition diversity improvement", "diversified team structure improvement", "team member variety improvement", "team diversity enhancement", "diversity of team members enhancement", "team composition variety enhancement", "diversified team makeup enhancement", "team member heterogeneity enhancement", "diversity within the team enhancement", "variety of team members enhancement", "team member diversification enhancement", "team composition diversity enhancement", "diversified team structure enhancement", "team member variety enhancement", "diversity", "variety", "diverseness", "multiformity", "multiplicity", "diversified"],	0,277490679

Personnes		"position_diversification ": ["company position diversity", "diversity of roles in the company", "position variety within the company", "diversified company job roles", "role heterogeneity in the company", "diversity within company positions", "variety of job roles in the company", "job role diversification in the company", "position composition variety within the company", "diversified company role structure", "job role variety within the company", "company position diversity analysis", "diversity of roles in the company analysis", "position variety within the company analysis", "diversified company job roles analysis", "role heterogeneity in the company analysis", "diversity within company positions analysis", "variety of job roles in the company analysis", "job role diversification in the company analysis", "position composition variety within the company analysis", "diversified company role structure analysis", "job role variety within the company analysis", "company position diversity optimization", "diversity of roles in the company optimization", "position variety within the company optimization", "diversified company job roles optimization", "role heterogeneity in the company optimization", "diversity within company positions optimization", "variety of job roles in the company optimization", "job role diversification in the company optimization", "position composition variety within the company optimization", "diversified company role structure optimization", "job role variety within the company optimization", "company position diversity improvement", "diversity of roles in the company improvement", "position variety within the company improvement", "diversified company job roles improvement", "role heterogeneity in the company improvement", "diversity within company positions improvement", "variety of job roles in the company improvement", "job role diversification in the company improvement", "position composition variety within the company improvement", "diversified company role structure improvement", "job role variety within the company improvement", "company position diversity enhancement", "diversity of roles in the company enhancement", "position variety within the company enhancement", "diversified company job roles enhancement", "role heterogeneity in the company enhancement", "diversity within company positions	0,277490679

		enhancement", "variety of job roles in the company enhancement", "job role diversification in the company enhancement", "position	

		composition variety within the company enhancement", "diversified company role structure enhancement,],	

Personnes	La compréhension et capacité d'utilisation de la technologiepar les employés	"software_understanding_ability ": ["employee software comprehension", "employee software proficiency", "employee software grasp", "software understanding by employees", "employee software literacy", "software proficiency of staff", "software competency among employees", "software familiarity among employees", "employee software aptitude", "software skill of employees", "employee software understanding analysis", "employee software proficiency analysis", "employee software grasp analysis", "software understanding by employees analysis", "employee software literacy analysis", "software proficiency of staff analysis", "software competency among employees analysis", "software familiarity among employees analysis", "employee software aptitude analysis", "software skill of employees analysis", "employee software understanding optimization", "employee software proficiency optimization", "employee software grasp optimization", "software understanding by employees optimization", "employee software literacy optimization", "software proficiency of staff optimization", "software competency among employees optimization", "software familiarity among employees optimization", "employee software aptitude optimization", "software skill of employees optimization", "employee software understanding improvement", "employee software proficiency improvement", "employee software grasp improvement", "software understanding by employees improvement", "employee software literacy improvement", "software proficiency of staff improvement", "software competency among employees improvement", "software familiarity among employees improvement", "employee software aptitude improvement", "software skill of employees improvement", "employee software understanding enhancement", "employee software proficiency enhancement", "employee software grasp enhancement", "software understanding by employees enhancement", "employee software literacy enhancement", "software proficiency of staff enhancement", "software competency among employees enhancement", "software familiarity among employees enhancement", "employee software aptitude enhancement", "software skill of employees enhancement", "technologies tools"", "technology tools"", "IT tools"", "technologies tool"", "technology tool"", "IT tool"],	Non significatif

Personnes		"tools_understanding_ability ": ["employee tools comprehension", "employee hardware proficiency", "employee tools grasp", "hardware understanding by employees", "employee hardware literacy", "hardware proficiency of staff", "hardware competency among employees", "hardware familiarity among employees", "employee hardware aptitude", "hardware skill of employees", "employee hardware understanding analysis", "employee hardware proficiency analysis", "employee hardware grasp analysis", "hardware understanding by employees analysis", "employee hardware literacy analysis", "hardware proficiency of staff analysis", "hardware competency among employees analysis", "hardware familiarity among employees analysis", "employee hardware aptitude analysis", "hardware skill of employees analysis", "employee hardware understanding optimization", "employee hardware proficiency optimization", "employee hardware grasp optimization", "hardware understanding by employees optimization", "employee hardware literacy optimization", "hardware proficiency of staff optimization", "hardware competency among employees optimization", "hardware familiarity among employees optimization", "employee hardware aptitude optimization", "hardware skill of employees optimization", "employee hardware understanding improvement", "employee hardware proficiency improvement", "employee hardware grasp improvement", "hardware understanding by employees improvement", "employee hardware literacy improvement", "hardware proficiency of staff improvement", "hardware competency among employees improvement", "hardware familiarity among employees improvement", "employee hardware aptitude improvement", "hardware skill of employees improvement", "employee hardware understanding enhancement", "employee hardware proficiency enhancement", "employee hardware grasp enhancement", "hardware understanding by employees enhancement", "employee hardware literacy enhancement", "hardware proficiency of staff enhancement", "hardware competency among employees enhancement", "hardware familiarity among employees enhancement", "employee hardware aptitude enhancement", "hardware skill of employees enhancement,],	Non significatif

Personnes	La flexibilité apportées par l'entreprise au niveau du travail	"work_flexibility ": ["company work flexibility", "workplace flexibility offered", "flexible work arrangements by company", "work level adaptability in company", "company work versatility", "workplace flexibility options", "flexible work options provided by company", "work level accommodation in company", "company work adaptability", "workplace flexibility offerings", "work flexibility analysis", "workplace flexibility offered analysis", "flexible work arrangements by company analysis", "work level adaptability in company analysis", "company work versatility analysis", "workplace flexibility options analysis", "flexible work options provided by company analysis", "work level accommodation in company analysis", "company work adaptability analysis", "workplace flexibility offerings analysis", "work flexibility optimization", "workplace flexibility offered optimization", "flexible work arrangements by company optimization", "work level adaptability in company optimization", "company work versatility optimization", "workplace flexibility options optimization", "flexible work options provided by company optimization", "work level accommodation in company optimization", "company work adaptability optimization", "workplace flexibility offerings optimization", "work flexibility improvement", "workplace flexibility offered improvement", "flexible work arrangements by company improvement", "work level adaptability in company improvement", "company work versatility improvement", "workplace flexibility options improvement", "flexible work options provided by company improvement", "work level accommodation in company improvement", "company work adaptability improvement", "workplace flexibility offerings improvement", "work flexibility enhancement", "workplace flexibility offered enhancement", "flexible work arrangements by company enhancement", "work level adaptability in company enhancement", "company work versatility enhancement", "workplace flexibility options enhancement", "flexible work options provided by company enhancement", "work level accommodation in company enhancement", "company work adaptability enhancement", "workplace flexibility offerings enhancement", "job flexibility", "flexible work arrangements", "work flexibility", "job flexibilities", "flexible work arrangement", "work flexibilities"],	Non significatif

Personnes	La flexibilité apportées par l'entreprise au niveau de l'horaire	"schedule_flexibility ": ["company schedule flexibility", "scheduling flexibility offered", "flexible scheduling by company", "schedule flexibility options provided by company", "company schedule adaptability", "scheduling adaptability in company", "company schedule versatility", "schedule flexibility offerings", "flexible scheduling options by company", "schedule adaptability in company analysis", "company schedule versatility analysis", "schedule flexibility offerings analysis", "flexible scheduling options by company analysis", "schedule adaptability in company optimization", "company schedule versatility optimization", "schedule flexibility offerings optimization", "flexible scheduling options by company optimization", "schedule adaptability in company improvement", "company schedule versatility improvement", "schedule flexibility offerings improvement", "flexible scheduling options by company improvement", "schedule adaptability in company enhancement", "company schedule versatility enhancement", "schedule flexibility offerings enhancement", "flexible scheduling options by company enhancement, "work schedule flexibility", "work schedule flexibilities", "schedule flexibility"", " schedule flexibilities", "schedules flexibilities", "job schedule flexibility", "job schedule flexibilities"],	Non significatif

Personnes	La motivation des employés à bien faire leur travail	"employee_motivation ": ["employee job motivation", "employee work encouragement", "employee job performance motivation", "job well-done motivation for employees", "employee task commitment", "employee work dedication", "employee job engagement", "employee job enthusiasm", "employee work drive", "employee job motivation analysis", "employee work encouragement analysis", "employee job performance motivation analysis", "job well-done motivation for employees analysis", "employee task commitment analysis", "employee work dedication analysis", "employee job engagement analysis", "employee job enthusiasm analysis", "employee work drive analysis", "employee job motivation optimization", "employee work encouragement optimization", "employee job performance motivation optimization", "job well-done motivation for employees optimization", "employee task commitment optimization", "employee work dedication optimization", "employee job engagement optimization", "employee job enthusiasm optimization", "employee work drive optimization", "employee job motivation improvement", "employee work encouragement improvement", "employee job performance motivation improvement", "job well-done motivation for employees improvement", "employee task commitment improvement", "employee work dedication improvement", "employee job engagement improvement", "employee job enthusiasm improvement", "employee work drive improvement", "employee job motivation enhancement", "employee work encouragement enhancement", "employee job performance motivation enhancement", "job well-done motivation for employees enhancement", "employee task commitment enhancement", "employee work dedication enhancement", "employee job engagement enhancement", "employee job enthusiasm enhancement", "employee work drive enhancement", "good work", "good works", "quality of work"", "motivation of employees to do their job well", "employee motivation for good performance", "employees' drive for high-quality work", "employees' dedication to perform well", "employees' commitment to excellence"],	Non significatif

Personnes	Les formations	"employee_training ": ["employee's training", "staff training", "training for employees", "employee skill development", "staff skill enhancement", "skill improvement for employees", "employee knowledge enhancement", "staff learning initiatives", "learning opportunities for employees", "employee training analysis", "staff training analysis", "training for employees analysis", "employee skill development analysis", "staff skill enhancement analysis", "skill improvement for employees analysis", "employee knowledge enhancement analysis", "staff learning initiatives analysis", "learning opportunities for employees analysis", "employee training optimization", "staff training optimization", "training for employees optimization", "employee skill development optimization", "staff skill enhancement optimization", "skill improvement for employees optimization", "employee knowledge enhancement optimization", "staff learning initiatives optimization", "learning opportunities for employees optimization", "employee training improvement", "staff training improvement", "training for employees improvement", "employee skill development improvement", "staff skill enhancement improvement", "skill improvement for employees improvement", "employee knowledge enhancement improvement", "staff learning initiatives improvement", "learning opportunities for employees improvement", "employee training enhancement", "staff training enhancement", "training for employees enhancement", "employee skill development enhancement", "staff skill enhancement enhancement", "skill improvement for employees enhancement", "employee knowledge enhancement enhancement", "staff learning initiatives enhancement", "learning opportunities for employees enhancement", "training"", "trainings"", "train"", "educational sessions", "learning programs", "training courses", "development sessions"", "educational session", "learning programs"],	0,394451291

Personnes	Le taux d’erreur des employés	" employee_error_rate ": ["employee error rate", "staff mistake frequency", "error rate among employees", "employee error analysis", "staff mistake frequency analysis", "error rate among employees analysis", "employee error optimization", "staff mistake frequency optimization", "error rate among employees optimization", "employee error improvement", "staff mistake frequency improvement", "error rate among employees improvement", "employee error enhancement", "staff mistake frequency enhancement", "error rate among employees enhancement", "employees' error rate", "error rate of employees", "mistake percentage of employees", "employees' accuracy rate", "error occurrence among employees"],	Non significatif

Technologie	La qualité des processus/logiciels	"new_technologies_use ": ["use of new technologies by customers", "customers adopting new technologies", "customer technology adoption", "new technologies utilization by clients", "customer technology usage", "new technologies use analysis", "customers adopting new technologies analysis", "customer technology adoption analysis", "new technologies utilization by clients analysis", "customer technology usage analysis", "new technologies use optimization", "customers adopting new technologies optimization", "customer technology adoption optimization", "new technologies utilization by clients optimization", "customer technology usage optimization", "new technologies use improvement", "customers adopting new technologies improvement", "customer technology adoption improvement", "new technologies utilization by clients improvement", "customer technology usage improvement", "new technologies use enhancement", "customers adopting new technologies enhancement", "customer technology adoption enhancement", "new technologies utilization by clients enhancement", "customer technology usage enhancement", "quality of processes"", "quality of process"", "processes quality", "software quality"", "softwares quality"", "quality of softwares", "quality of software", "quality of the softwares", "quality of the software", "quality of the processes", "quality of the process"],	3,981825849

Technologie		"process_quality_speed ": ["quality of processes/software: speed of execution", "process/software speed quality", "execution speed of processes/software", "process/software execution velocity", "process/software speed analysis", "quality of processes/software: speed of execution analysis", "process/software speed quality analysis", "execution speed of processes/software analysis", "process/software execution velocity analysis", "process/software speed optimization", "quality of processes/software: speed of execution optimization", "process/software speed quality optimization", "execution speed of processes/software optimization", "process/software execution velocity optimization", "process/software speed improvement", "quality of processes/software: speed of execution improvement", "process/software speed quality improvement", "execution speed of processes/software improvement", "process/software execution velocity improvement", "process/software speed enhancement", "quality of processes/software: speed of execution enhancement", "process/software speed quality enhancement", "execution speed of processes/software enhancement", "process/software execution velocity enhancement,],	3,981825849

Technologie		"process_quality_error ": ["process/software quality: error (bug)", "software/process error quality", "bug rate in processes/software", "process/software error analysis", "process/software quality: error (bug) analysis", "software/process error quality analysis", "bug rate in processes/software analysis", "process/software error optimization", "process/software quality: error (bug) optimization", "software/process error quality optimization", "bug rate in processes/software optimization", "process/software error improvement", "process/software quality: error (bug) improvement", "software/process error quality improvement", "bug rate in processes/software improvement", "process/software error enhancement", "process/software quality: error (bug) enhancement", "software/process error quality enhancement", "bug rate in processes/software enhancement", "improve process", "improve processes", "improving process", "improving processes", "improve software", "improve softwares", "improves software", "improves softwares", "software improving", "software improvings", "software update", "software updates", "softwares update", "softwares updates"],	3,981825849

Technologie		"software_improvement_usefulness ": ["software improvement: usefulness", "software enhancement value", "usefulness of software upgrades", "software utility enhancement", "software improvement analysis", "software improvement: usefulness analysis", "software enhancement value analysis", "usefulness of software upgrades analysis", "software utility enhancement analysis", "software improvement optimization", "software improvement: usefulness optimization", "software enhancement value optimization", "usefulness of software upgrades optimization", "software utility enhancement optimization", "software improvement improvement", "software improvement: usefulness improvement", "software enhancement value improvement", "usefulness of software upgrades improvement", "software utility enhancement improvement", "software improvement enhancement", "software improvement: usefulness enhancement", "software enhancement value enhancement", "usefulness of software upgrades enhancement", "software utility enhancement enhancement,],	3,981825849

Technologie	L'utilisation des méthodologies agiles reconnues comme Kanban/Scrum/Scrumban.	"agile_methodology_use ": ["use of agile methodology recognized as Kanban / Scrum / Scrumban.", "Kanban / Scrum / Scrumban usage", "utilization of recognized agile methodologies", "use of agile frameworks", "agile methodology use analysis", "use of agile methodology recognized as Kanban / Scrum / Scrumban. analysis", "Kanban / Scrum / Scrumban usage analysis", "utilization of recognized agile methodologies analysis", "use of agile frameworks analysis", "agile methodology use optimization", "use of agile methodology recognized as Kanban / Scrum / Scrumban. optimization", "Kanban / Scrum / Scrumban usage optimization", "utilization of recognized agile methodologies optimization", "use of agile frameworks optimization", "agile methodology use improvement", "use of agile methodology recognized as Kanban / Scrum / Scrumban. improvement", "Kanban / Scrum / Scrumban usage improvement", "utilization of recognized agile methodologies improvement", "use of agile frameworks improvement", "agile methodology use enhancement", "use of agile methodology recognized as Kanban / Scrum / Scrumban. enhancement", "Kanban / Scrum / Scrumban usage enhancement", "utilization of recognized agile methodologies enhancement", "use of agile frameworks enhancement", "delay rate"", "lateness", "time delay", "delayed completion", "postponement"],	0,851708126

Technologie	Le retard des développements informatiques	"it_project_delay ": ["delay of IT projects", "IT project postponement", "project delay analysis", "delay of IT projects analysis", "IT project postponement analysis", "project delay optimization", "delay of IT projects optimization", "IT project postponement optimization", "project delay improvement", "delay of IT projects improvement", "IT project postponement improvement", "project delay enhancement", "delay of IT projects enhancement", "IT project postponement enhancement", "communication tools, "communication tool", "Microsoft Teams", "Google Meet", "call", "calls", "communications tools", "communications tools"],	0,003642258

Technologie	L'utilisation des technologies de communication	"it_project_delay ": ["delay of IT projects", "IT project postponement", "project delay analysis", "delay of IT projects analysis", "IT project postponement analysis", "project delay optimization", "delay of IT projects optimization", "IT project postponement optimization", "project delay improvement", "delay of IT projects improvement", "IT project postponement improvement", "project delay enhancement", "delay of IT projects enhancement", "IT project postponement enhancement", "communication tools, "communication tool", "Microsoft Teams", "Google Meet", "call", "calls", "communications tools", "communications tools"],	0,109531083

Technologie	L'utilisation des nouvelles technologies par les clients	"communication_technologies_use ": ["use of communication technologies", "communication tools utilization", "communication methods usage", "technology for communication", "communication technologies use analysis", "use of communication technologies analysis", "communication tools utilization analysis", "communication methods usage analysis", "technology for communication analysis", "communication technologies use optimization", "use of communication technologies optimization", "communication tools utilization optimization", "communication methods usage optimization", "technology for communication optimization", "communication technologies use improvement", "use of communication technologies improvement", "communication tools utilization improvement", "communication methods usage improvement", "technology for communication improvement", "communication technologies use enhancement", "use of communication technologies enhancement", "communication tools utilization enhancement", "communication methods usage enhancement", "technology for communication enhancement", "technology adoption by customers", "customer technology usage", "client use of new technologies", "customer adoption of new tech", "client technology utilization"],	Non significatif

Annexe 4.4. Tableau récapitulatif des KPIs et de son importance selon la méthode par occurrence.

Ce tableau représente les KPIs significatifs selon la méthode par occurrence. Pour chaque KPI, nous avons le nombre d'articles dans lesquels ses mots-clés ont été cités et cette occurrence relative. Par exemple, le KPI « qualité des processus/logiciels : erreur (bug) » appartient à la dimension technologies, ces mots-clés ont été cités dans 120 articles et constituent 5,53% de l'ensemble des occurrences des KPIs significatifs.

Dimensions	KPI	Occurrence pdf	Occurrence relative
Technologie	La qualité des processus/logiciels : erreur (bug)	120	5,53%
Technologie	Amélioration des logiciels : fréquence	120	5,53%
Technologie	Amélioration des logiciels : utilité	120	5,53%
Technologie	La qualité des processus/logiciels : vitesse d'exécution	120	5,53%

Technologie	L'utilisation des méthodologie agile reconnue comme Kanban/Scrum/Scrumban.	117	5,39%
Organisation	La facilité de communication sur le lieu de travail	100	4,61%
Organisation	La facilité de communication avec l'équipe	97	4,47%
Organisation	La facilité de communication avec les managers, ainsi que la confiance envers ceux-ci	97	4,47%
Organisation	La facilité de communication avec une équipe différente	97	4,47%
Personnes	Les formations	97	4,47%
Culture	La fréquence de réunions	38	1,75%
Culture	L'utilité des réunions	62	2,86%
KPI opérationnel	Le chiffre d'affaire	62	2,86%
Leadership	La fréquence de feedbacks	70	3,23%
Leadership	L'utilité des feedbacks	57	2,63%
Personnes	La diversification au sein de l'équipe	69	3,18%
Personnes	La diversification au sein des postes de l'entreprise	69	3,18%
Technologie	L'utilisation des technologies de communication	73	3,36%
Culture	L'envie de travailler pour l'entreprise	73	3,36%
Organisation	Le bien-être physique sur le lieu de travail	37	1,71%
Organisation	L'adaptabilité du lieu de travail	30	1,38%
Organisation	La performance liée au lieu de travail	30	1,38%
Organisation	L'attractivité du lieu de travail	30	1,38%
Leadership	Les discriminations dans l'entreprise	39	1,80%
Leadership	Le nombre de conflits au sein de l'équipe	39	1,80%
Leadership	Le nombre de conflits avec son manager	39	1,80%
Leadership	Le nombre de conflits entre différentes équipes	48	2,21%
Culture	La compréhension du projet de l'équipe	44	2,03%
Culture	La compréhension de la place de l'employé au sein de l'entreprise	35	1,61%

KPI client	La satisfaction des clients liés par rapport aux produits propsosés par l'entreprise	32	1,47%
Technologie	Le retard des projets informatiques	5	0,23%
KPI opérationnel	Le nombre d'employés	5	0,23%
Culture	La cohésion d'équipe	17	0,78%
Culture	La compréhension du projet de l'entreprise et de ses valeurs par les employés	11	0,51%
Personnes	La compréhension et capacité d'utilisation des logiciels (software) par les employés	13	0,60%
Personnes	La compréhension et la capacité d'utilisation des outils (hardware) par les employés	13	0,60%
Culture	L'apprentissage vis-à-vis des tâches à faire	12	0,55%
Culture	L'apprentissage vis-à-vis des skills à avoir	8	0,37%
Culture	La rétention d'employé	9	0,41%
Technologie	L'utilisation des technologies de communication	5	0,23%
Organisation	La satisfaction liée à la gestion du personnel	4	0,18%
Culture	L'apprentissage vis-à-vis des skills à avoir	2	0,09%
KPI client	Le volumes de clients	2	0,09%
Personnes	La flexibilité apportée par l'entreprise au niveau du travail	2	0,09%
Organisation	La satisfaction liée à la gestion de l'entreprise de manière globale	1	0,05%

Annexe 4.5. KPIs non-significatif selon la méthode par occurrence.

Cette annexe reprend l'ensemble des KPIs ayant une occurrence relative inférieur à 0,01% et donc considéré comme non significatifs. Pour chacun des ses KPIs, l'annexe reprend le nom du KPI et sa dimension.

Dimension	**KPIs**
Culture	L'apprentissage vis-à-vis des skills à avoir

KPI client	Le volumes de clients
Personnes	La flexibilité apportée par l'entreprise au niveau du travail
Organisation	La satisfaction liée à la gestion de l'entreprise de manière globale
Organisation	La satisfaction liée à la gestion de son manager direct
Organisation	Le volumes de clients
Personnes	La flexibilité apportée par l'entreprise au niveau des horaires
Personnes	La motivation des employés à bien faire leur travail
Personnes	Le taux d'erreur des employés

Annexe 4.6. KPIs significatifs selon la méthode par fréquence

Dans cette annexe, nous reprenons seulement les KPIs significatifs selon la méthode par fréquence, c'est-à-dire que leur importance relative est supérieur à 0,01%. Pour chacun de ses KPIs, nous retrouvons dans cette annexe sa dimension, son nom, le nombre d'appparitions de ses mots-clés dans les articles, le nombre d'articles dans lesquels ses mots-clés ont été cités, le produit de ses critères et ce produit relatif. Par exemple, le KPI « La qualité des processus/logiciels : erreur (bug) » appartient à la dimension technologie, ses mot-clés ont été cités 5870 fois dans 120 articles différents. Son score d'importance est 704.000, soit 21,084% de l'agilité d'entreprise.

Dimension	KPI	Occurrence mots clés	Nombre pdf	Occurrence*nombre pdf	Occurrence*nombre pdf relatif
Technologie	La qualité des processus/logiciels : erreur (bug)	5870	120	704.400	21,084%
Technologie	Amélioration des logiciels : fréquence	5866	120	703.920	21,070%
Technologie	Amélioration des logiciels : utilité	5866	120	703.920	21,070%
Technologie	La qualité des processus/logiciels : vitesse d'exécution	5866	120	703.920	21,070%

Technologie	L'utilisation des méthodologies agile reconnue comme Kanban/Scrum/Scrumban.	2624	117	307.008	9,189%
People	Les formations	1373	100	137.300	4,110%
Organisation	La facilité de communication sur le lieu de travail	1129	97	109.513	3,278%
Organisation	La facilité de communication avec l'équipe	1127	97	109.319	3,272%
Organisation	La facilité de communication avec les managers, ainsi que la confiance envers ceux-ci	1127	97	109.319	3,272%
Organisation	La facilité de communication avec une équipe différente	1127	97	109.319	3,272%
Culture	La fréquence de réunions	696	62	43.152	1,292%
Culture	L'utilité des réunions	696	62	43.152	1,292%
Technologie	L'utilisation des technologies de communication	854	38	32.452	0,971%
KPI opérationnel	Le chiffre d'affaires	392	70	27.440	0,821%
Leadership	La fréquence de feedbacks	348	69	24.012	0,719%
Leadership	L'utilité des feedbacks	348	69	24.012	0,719%
People	La diversification au sein de l'équipe	295	73	21.535	0,645%
People	La diversification au sein des postes de l'entreprise	293	73	21.389	0,640%
Culture	L'envie de travailler pour l'entreprise	357	57	20.349	0,609%
Organisation	Le bien-être physique sur le lieu de travail	292	37	10.804	0,323%

Leadership	Les discriminations dans l'entreprise	221	48	10.608	0,318%
Leadership	Le nombre de conflits au sein de l'équipe	246	39	9.594	0,287%
Leadership	Le nombre de conflits avec son manager	246	39	9.594	0,287%
Leadership	Le nombre de conflits entre différentes équipes	246	39	9.594	0,287%
Culture	La compréhension du projet de l'équipe	190	44	8.360	0,250%
Organisation	L'adaptabilité du lieu de travail	277	30	8.310	0,249%
Organisation	La performance liée au lieu de travail	277	30	8.310	0,249%
Organisation	L'attractivité du lieu de travail	277	30	8.310	0,249%
Culture	La compréhension de la place de l'employé au sein de l'entreprise	78	35	2.730	0,082%
KPI client	La satisfaction des clients liés par rapport aux produits proposés par l'entreprise	48	32	1.536	0,046%
KPI opérationnel	Le nombre d'employés	27	17	459	0,014%

Annexe 4.7. KPIs non-significatif selon la méthode par fréquence.

Cette annexe reprend l'ensemble des KPIs ayant une fréquence relative inférieur à 0,01% et donc considéré comme non significatifs. Pour chacun de ses KPIs, l'annexe reprend le nom du KPI, sa dimension et sa pondération par fréquence.

Dimension	KPI	Pondération par fréquence
Culture	La cohésion d'équipe	0,007%
Culture	La compréhension du projet de l'entreprise et de ses valeurs par les employés	0,007%
People	La compréhension et capacité d'utilisation des logiciels (software) par les employés	0,005%

People	La compréhension et la capacité d'utilisation des outils (hardware) par les employés	0,005%
Culture	L'apprentissage vis-à-vis des tâches à faire	0,005%
Culture	L'apprentissage vis-à-vis des skills à avoir	0,004%
Culture	La rétention d'employé	0,002%
Technologie	L'utilisation des technologies de communication	0,002%
Technologie	Le retard des projets informatiques	0,001%
Organisation	La satisfaction liée à la gestion du personnel	0,000%
Culture	L'apprentissage vis-à-vis des skills à avoir	0,000%
KPI client	Le volumes de clients	0,000%
People	La flexibilité apportée par l'entreprise au niveau du travail	0,000%
Organisation	La satisfaction liée à la gestion de l'entreprise de manière globale	0,000%
Organisation	La satisfaction liée à la gestion de son manager direct	0,000%
Organisation	Le volumes de clients	0,000%
People	La flexibilité apportée par l'entreprise au niveau des horaires	0,000%
People	La motivation des employés à bien faire leur travail	0,000%
People	Le taux d'erreur des employés	0,000%

Annexe 4.8. KPIs significatifs selon la méthode TF-IDF

Dans cette annexe, nous reprenons seulement les KPIs significatifs selon la méthode par TF_IDF, c'est-à-dire que leur importance relative est supérieur à 0,01%. Pour chacun de ses KPIs, nous retrouvons dans cette annexe sa dimension, son nom, son score d'importance fourni par la méthode TF-IDF et l'importance relative. Par exemple, le KPI « La qualité des processus/logiciels : erreur (bug) » appartient à la dimension technologie, a un score d'importance de 9,512079568 et une importance relative de 13,08% de l'agilité d'entreprise.

Dimensions	**KPI**	**Importance IDF**	**Importance relative**
Technologie	La qualité des processus/logiciels : vitesse d'exécution	9,512079568	16,08%

Technologie	La qualité des processus/logiciels : erreur (bug)	9,512079568	16,08%
Technologie	Amélioration des logiciels : utilité	9,512079568	16,08%
Technologie	Amélioration des logiciels : fréquence	9,512079568	16,08%
Organisation	La facilité de communication sur le lieu de travail	2,22962443410413	3,77%
Organisation	La facilité de communication avec les managers, ainsi que la confiance envers ceux-ci	2,22962443410413	3,77%
Organisation	La facilité de communication avec l'équipe	2,22962443410413	3,77%
Organisation	La facilité de communication avec une équipe différente	2,22962443410413	3,77%
Technologie	L'utilisation des méthodologies agile reconnue comme Kanban/Scrum/Scrumban.	1,80966780077086	3,06%
Culture	La fréquence de réunions	1,14992736439879	1,94%
Culture	L'utilité des réunions	1,14992736439879	1,94%
Personnes	Les formations	0,971027379073485	1,64%
KPI opérationnel	Le chiffre d'affaires	0,795641363165977	1,34%
Leadership	L'utilité des feedbacks	0,680760325	1,15%
Leadership	La fréquence de feedbacks	0,680760325	1,15%

Personnes	La diversification au sein de l’équipe	0,663155432	1,12%
Personnes	La diversification au sein des postes de l’entreprise	0,663155432	1,12%
Technologie	L'utilisation des technologies de communication	0,484385108	0,82%
Organisation	L'attractivité du lieu de travail	0,463974056645298	0,78%
Organisation	La performance liée au lieu de travail	0,463974056645298	0,78%
Organisation	L’adaptabilité du lieu de travail	0,463974056645298	0,78%
Organisation	Le bien-être physique sur le lieu de travail	0,463974056645298	0,78%
Leadership	Les discriminations dans l’entreprise	0,375911707	0,64%
Leadership	Le nombre de conflits au sein de l’équipe	0,246153633	0,42%
Leadership	Le nombre de conflits entre différentes équipes	0,246153633	0,42%
Leadership	Le nombre de conflits avec son manager	0,246153633	0,42%
Culture	L’envie de travailler pour l'entreprise	0,165954729	0,28%
Technologie	Le retard des projets informatiques	0,006800047	0,01%

Annexe 4.9. KPIs non-significatifs selon la méthode TF-IDF.

Cette annexe reprend l'ensemble des KPIs ayant une occurrence relative inférieur à 0,01% et donc considéré comme non significatifs. Pour chacun des ses KPIs, l'annexe reprend le nom du KPI et sa dimension.

Dimension	KPI
Culture	La compréhension du projet de l'entreprise et de ses valeurs par les employés
Culture	La compréhension de la place de l'employé au sein de l'entreprise
Culture	La compréhension du projet de l'équipe
Culture	La rétention d'employé
Culture	La cohésion d'équipe
Culture	L'apprentissage vis-à-vis des tâches à faire
Culture	L'apprentissage vis-à-vis des skills à avoir
KPI clients	La satisfaction des clients liés par rapport aux produits proposés par l'entreprise
KPI opérationnel	Le nombre d'employés
KPI opérationnel	Le volumes de clients
Leadership	La satisfaction liée à la gestion de son manager direct
Leadership	La satisfaction liée à la gestion de l'entreprise de manière globale
Leadership	La satisfaction liée à la gestion du personnel
Organisation	Le partage de connaissance à l'extérieur de l'équipe
Organisation	Le partage de connaissance à l'intérieur de l'équipe
Personnes	La compréhension et capacité d'utilisation des logiciels (software) par les employés

Personnes	La compréhension et la capacité d'utilisation des outils (hardware) par les employés
Personnes	La flexibilité apportée par l'entreprise au niveau du travail
Personnes	La flexibilité apportée par l'entreprise au niveau des horaires
Personnes	La motivation des employés à bien effectuer leur travail
Personnes	Le taux d'erreur des employés

Annexe 4.10. Questionnaire

Key Performance Indicators	Questions
La compréhension du projet de l'entreprise et de ses valeurs par les employés	De 0 à 5, comment vous positionnez vous par rapport à la connaissance des valeurs de l'entreprise ? De 0 à 5, vos valeurs sont-elles en adéquation avec celles de votre entreprise?
La compréhension de la place de l'employé au sein de l'entreprise	De 0 à 5, connaissez-vous votre position dans l'organigramme de l'entreprise?
La compréhension du projet de l'équipe	De 0 à 5, comprenez-vous l'objectif de votre équipe ?

Cette annexe reprend l'ensemble des questions posées pour évaluer chaque KPI. Pour chacun de nos KPIs, nous avons défini des questions à poser aux entreprises qui permettent de noter ces entreprises en fonction du KPIs. Ces notes seront ensuite intégrées dans notre modèle afin de calculer un score d'agilité.

L'envie de travailler pour l'entreprise	De 0 à 5, êtes-vous motivé à travailler pour l'entreprise ?
La rétention d'employé	De 0 à 5, mesurez votre envie de rester dans votre entreprise
La cohésion d'équipe	De 0 à 5, aimez-vous travailler en groupe? De 0 à 5, considérez-vous que vous faites partie d'une équipe soudée ?

L’apprentissage vis-à-vis des tâches à faire	De 0 à 5, par rapport à l'année passée, à quel point effectuez-vous moins d'erreur lors de l'exécution de vos tâches ? De 0 à 5, par rapport à l'année passée, à quel point comprenez-vous mieux les tâches que vous réalisez ? De 0 à 5, par rapport à l'année passée, à quel point effectuez-vous les tâches plus rapidement ? De 0 à 5, par rapport à il y a 5 ans, à quel point comprenez-vous mieux les tâches que vous réalisez ? De 0 à 5, par rapport à il y a 5 ans, à quel point effectuez-vous les tâches plus rapidement ? De 0 à 5, par rapport à il y a 5 ans, à quel point effectuez-vous moins d'erreur lors de l'exécution de vos tâches ?
L’apprentissage vis-à-vis des skills à avoir	De 0 à 5, par rapport à l'année passée, à quel point avez-vous appris des choses au travail, qui ne relève pas exactement de votre travail (Exemple : Langue, informatique, capacité de présentation, outils informatiques, etc.) De 0 à 5, par rapport à il y a 5 ans, à quel point avez-vous appris des choses au travail, qui ne relève pas exactement de votre travail (Exemple : nouvelle langue, informatique, capacité de présentation, outils informatiques, etc.)
La fréquence de réunions	De 0 à 5, comment estimez-vous la pertinence de vos fréquence de réunion?
L'utilité des réunions	De 0 à 5, comment estimez-vous l'utilité de ces réunions?
La satisfaction des clients liés par rapport aux produits propsosés par l’entreprise	De 0 à 5, comment évolue le NPS de vos clients ?
Le chiffre d'affaire	De 0 à 5, comment évolue votre chiffre d'affaires ?
Le nombre d'employés	De 0 à 5, comment votre nombre d'employé évolue-t-il favorablement?
Le volumes de clients	De 0 à 5, comment évolue votre volumes de clients ?
Le nombre de conflits au sein de l’équipe	De 0 à 5, mesurez la fréquence avec laquelle des conflits émergent dans votre équipe
Le nombre de conflits entre différentes équipes	De 0 à 5, mesurez la fréquence avec laquelle des conflits émergent entre deux personnes d'équipe différente
Le nombre de conflits avec son manager	De 0 à 5, mesurez la fréquence avec laquelle des conflits émergent entre vous et votre manager direct

La satisfaction liée à la gestion de son manager direct	De 0 à 5, êtes-vous satisfait de la gestion de l'équipe de votre manager ?

La satisfaction liée à la gestion de l'entreprise de manière globale	De 0 à 5, êtes-vous satisfait de la gestion de l'organisation dans son ensemble ?
Les discriminations dans l'entreprise	De 0 à 5, vous sentez vous discriminé dans votre entreprise ? De 0 à 5, vous sentez vous discriminé par vos collègues ? De 0 à 5, vous sentez vous discriminé par vos managers ?
L'utilité des feedbacks	De 0 à 5, utilisez-vous le feedback de vos clients pour l'amélioration de vos processus? De 0 à 5, mesurez l'efficacité des feedbacks de vos managers?
La fréquence de feedbacks	De 0 à 5, mesurez la fréquence de feedback sur vos tâches quotidiennes avec soit des personnes de votre équipe, soit des personnes d'une autre équipe, soit avec votre manager ?
L'attractivité du lieu de travail	De 0 à 5, êtes-vous content d'aller sur votre lieu de travail ?
La performance liée au lieu de travail	De 0 à 5, mesurez votre performance sur le lieu de travail par rapport à votre performance sur d'autres lieux (comme le télétravail à la maison, chez un client, …)
L'adaptabilité du lieu de travail	De 0 à 5, à quelle fréquence faites-vous du télétravail ou travaillez-vous sur lieu différent de votre lieu de travail habituel ? De 0 à 5, changez-vous souvent de place sur le lieu de travail ? De 0 à 5, pouvez-vous adapter les paramètres de votre lieu de travail (bruit, lumière, température, air) De 0 à 5, comment mesurez-vous l'agréabilité du niveau sonore sur votre lieu de travail ? De 0 à 5, comment mesurez-vous l'agréabilité du niveau lumineux sur votre lieu de travail ? De 0 à 5, comment mesurez-vous l'agréabilité de la température sur votre lieu de travail ? De 0 à 5, comment mesurez-vous l'agréabilité de l'air sur votre lieu de travail ?
Le partage de connaissance au sein de l'équipe	De 0 à 5, comment estimez-vous le partage de connaissance au sein de votre équipe?
Le partage de connaissance à l'extérieur de l'équipe	De 0 à 5, comment estimez-vous le partage de connaissance avec d'autres équipes?

Le bien-être physique sur le lieu de travail	De 0 à 5, vous considérez-vous bien sur votre lieu de travail ?
La facilité de communication sur le lieu de travail	De 0 à 5, considérez-vous que votre endroit de travail est propice à la communication ?
La facilité de communication avec les managers, ainsi que la confiance envers ceux-ci	De 0 à 5, à quel point il est facile de discuter avec votre manager direct ? De 0 à 5, à quel point il est facile de discuter avec vos managers indirects (Personnes au-dessus de ton manager direct)
La facilité decommunication avec l'équipe	De 0 à 5, considérez-vous qu'il est facile de communiquer avec chaque personne de votre équipe? De 0 à 5, mesurez la fréquence avec laquelle vous communiquez avec votre équipe ?

La facilité de communication avec une équipe différente	De 0 à 5, mesurez la fréquence avec laquelle vous communiquez avec quelqu'un d'une équipe différente ? De 0 à 5, considérez-vous qu'il est facile de communiquer avec chaque personne d'une équipe différente ?
La diversification au sein de l'équipe	De 0 à 5, considérez-vous que votre équipe soit diversifié par rapport à l'âge ? De 0 à 5, considérez-vous que votre équipe soit diversifié par rapport à son origine géographique ? De 0 à 5, considérez-vous que votre équipe est diversifié par rapport au genre ?
La diversification au sein des postes de l'entreprise	De 0 à 5, vous considérez-vous la diversification au sein des postes de management dans l'entreprise?
La compréhension et capacité d'utilisation des logiciels (software) par les employés	De 0 à 5, mesurez votre compréhension et votre utilisation des outils technologiques (Word, Excel, Google, etc.)
La compréhension et la capacité d'utilisation des outils (hardware) par les employés	De 0 à 5, mesurez votre compréhension appareils technologiques (Ordinateurs, GSM, Tablettes, etc.)
La flexibilité apportée par l'entreprise au niveau du travail	De 0 à 5, considérez-vous que l'entreprise soit flexible vis-à-vis des tâches à faire

La flexibilité apportée par l'entreprise au niveau des horaires	De 0 à 5, considérez-vous que l'entreprise soit flexible vis-à-vis des horaires de travail ? De 0 à 5, considérez-vous que l'entreprise soit flexible vis-à-vis des congés ?
La motivation des employés à bien effectuer leur travail	De 0 à 5, mesurez votre degré d'intérêt quant à la réalisation parfaite de votre travail
Les formations	De 0 à 5, êtes-vous formé dans le cadre de votre travail ? De 0 à 5, à quelle fréquence suivez-vous des formations ? De 0 à 5, mesurez l'utilité de ces formations ?
Le taux d'erreur des employés	De 0 à 5, mesurez votre taux d'erreur sur vos tâches quotidiennes.
L'utilisation des nouvelles technologies par les clients	De 0 à 5, comment estimez-vous l'utilisation des nouvelles technologies par les clients?
La qualité des processus/logiciels : vitesse d'exécution	De 0 à 5, considérez-vous que les processus entre la demande d'un client et la livraison du résultat final est optimisé? De 0 à 5, mesurez la performance de vos processus/logiciels
La qualité des processus/logiciels : erreur (bug)	De 0 à 5, à quel point il y a des bugs dans l'utilisation quotidienne des applicatifs de gestion ? De 0 à 5, mesurez le pourcentage d'erreur effectué par vos processus/logiciels
Amélioration des logiciels : utilité	De 0 à 5, vos logiciels et applications internes ont-ils connu des améliorations dans les 10 dernières années ? De 0 à 5, dans quelle mesure maitrisez-vous les logiciels informatiques utilisés dans l'entreprise?
Amélioration des logiciels : fréquence	De 0 à 5, pouvez-vous évaluer la fréquence de déploiement d'amélioration des vos applicatifs ?
L'utilisation des méthodologies agile reconnue comme Kanban/Scrum/Scrumban.	De 0 à 5, utilisez-vous des méthodologies agiles reconnues comme Kanban/Scrum/Scrumban
Le retard des projets informatiques	De 0 à 5, à quel point il y a des retards dans la livraison des développements informatiques ?
Utilisation des technologies de communication	De 0 à 5, utilisez-vous beaucoup de technologies de communcations tel que Google Meet, Microsoft Teams, … ?

Annexe 4.11. Résultat de l'entreprise Solidaris aux questionnaires

Le directeur de la digitalisation de Solidaris a répondu à chacune des questions de notre questionnaire concernant les KPIs définis comme significatifs. Le tableau comprend 2 colonnes, la première sont les questions et la deuxième comprend les notes.

Question	**Réponses**
De 0 à 5, êtes-vous motivé à travailler pour l'entreprise ?	4
De 0 à 5, comment estimez-vous la pertinence de vos fréquences de réunion?	2
De 0 à 5, comment estimez-vous l'utilité de ces réunions?	2
De 0 à 5, comment évolue votre chiffre d'affaires ?	3
De 0 à 5, mesurez la fréquence avec laquelle des conflits émergent dans votre équipe	4
De 0 à 5, mesurez la fréquence avec laquelle des conflits émergent entre deux personnes d'équipe différente	3
De 0 à 5, mesurez la fréquence avec laquelle des conflits émergent entre vous et votre manager direct	3
De 0 à 5, vous sentez vous discriminé dans votre entreprise ?	5
De 0 à 5, vous sentez vous discriminé par vos collègues ?	5
De 0 à 5, vous sentez vous discriminé par vos managers ?	5
De 0 à 5, utilisez-vous le feedback de vos clients pour l'amélioration de vos processus?	3
De 0 à 5, mesurez l'efficacité des feedbacks de vos managers?	3

De 0 à 5, mesurez la fréquence de feedback sur vos tâches quotidiennes avec soit des personnes de votre équipe, soit des personnes d'une autre équipe, soit avec votre manager ?	2

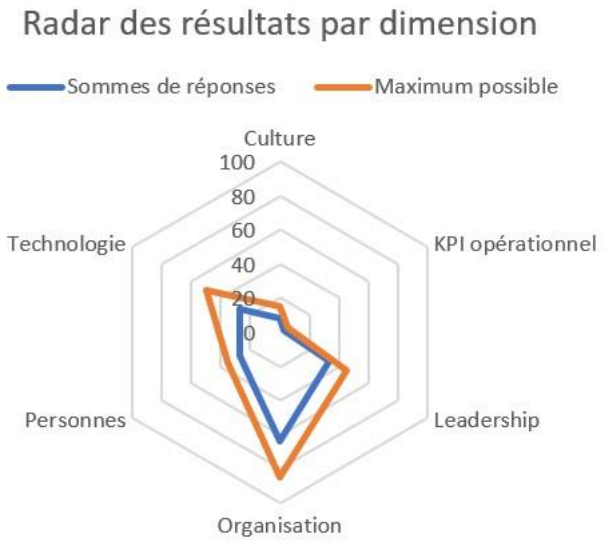
De 0 à 5, êtes-vous content d'aller sur votre lieu de travail ?	4
De 0 à 5, mesurez votre performance sur le lieu de travail par rapport à votre performance sur d'autres lieux (comme le télétravail à la maison, chez un client, …)	4
De 0 à 5, à quelle fréquence faites-vous du télétravail ou travaillez-vous sur lieu différent de votre lieu de travail habituel ?	4
De 0 à 5, changez-vous souvent de place sur le lieu de travail ?	5
De 0 à 5, pouvez-vous adapter les paramètres de votre lieu de travail (bruit, lumière, température, air)	3
De 0 à 5, comment mesurez-vous l'agréabilité du niveau sonore sur votre lieu de travail ?	3
De 0 à 5, comment mesurez-vous l'agréabilité du niveau lumineux sur votre lieu de travail ?	4
De 0 à 5, comment mesurez-vous l'agréabilité de la température sur votre lieu de travail ?	3
De 0 à 5, comment mesurez-vous l'agréabilité de l'air sur votre lieu de travail ?	4
De 0 à 5, comment estimez-vous le partage de connaissance au sein de votre équipe?	4
De 0 à 5, considérez-vous que votre endroit de travail est propice à la communication ?	4
De 0 à 5, à quel point il est facile de discuter avec votre manager direct ?	4
De 0 à 5, à quel point il est facile de discuter avec vos managers indirects (Personnes au-dessus de ton manager direct)	3
De 0 à 5, considérez-vous qu'il est facile de communiquer avec chaque personne de votre équipe?	5

De 0 à 5, mesurez la fréquence avec laquelle vous communiquez avec votre équipe ?	4

De 0 à 5, mesurez la fréquence avec laquelle vous communiquez avec quelqu'un d'une équipe différente ?	3
De 0 à 5, considérez-vous qu'il est facile de communiquer avec chaque personne d'une équipe différente ?	3
De 0 à 5, considérez-vous que votre équipe est diversifié par rapport à l'âge ?	4
De 0 à 5, considérez-vous que votre équipe est diversifié par rapport à son originie géographique ?	4
De 0 à 5, considérez-vous que votre équipe est diversifié par rapport au genre ?	4
De 0 à 5, vous considérez-vous la diversification au sein des postes de management dans l'entreprise?	3
De 0 à 5, êtes-vous formé dans le cadre de votre travail ?	4
De 0 à 5, à quelle fréquence suivez-vous des formations ?	4
De 0 à 5, mesurez l'utilité de ces formations ?	4
De 0 à 5, comment estimez-vous l'utilisation des nouvelles technologies par les clients?	4
De 0 à 5, considérez-vous que les processus entre la demande d'un client et la livraison du résultat final est optimisé?	3
De 0 à 5, mesurez la performance de vos processus/logiciels	2
De 0 à 5, à quel point il y a des bugs dans l'utilisation quotidienne des applicatifs de gestion ?	2
De 0 à 5, mesurez le pourcentage d'erreur effectué par vos processus/logiciels	2

De 0 à 5, vos logiciels et applications internes ont-ils connu des améliorations dans les 10 dernières années ?	2
De 0 à 5, dans quelle mesure maitrisez-vous les logiciels informatiques utilisés dans l'entreprise?"	4
De 0 à 5, pouvez-vous évaluer la fréquence de déploiement d'amélioration des vos applicatifs ?	3
De 0 à 5, utilisez-vous des méthodologies agiles reconnues comme Kanban/Scrum/Scrumban?	3
De 0 à 5,à quel point il y a des retards dans la livraison des développements informatiques ?	2

Annexe 4.12. Radar des résultats par dimension



Nous montrons les résultats de Solidaris sous forme d'un graphe radar. Nous pouvons constater que l'écart entre les deux lignes représente bien les 41% manquants de l'entreprise pour atteindre la note maximale.

Annexe 4.13. Interview Solidaris

Nous avons pu interroger le directeur des projets digitaux de Solidaris, Thibault Mestré, d'une part parce que sa fonction lui permet d'accéder à des informations d'entreprise lui permettant de répondre au questionnaire et d'autre part parce que l'agilité d'entreprise est un des objectifs du plan de transformation digitale de Solidaris.

Lorsqu'il s'agit d'interroger un directeur d'une entreprise pour enquêter sur l'agilité de celle-ci, nous avons choisi d'établir le contexte et de poser ensuite des questions de fond pour obtenir des informations spécifiques.

Pouvez en quelques mots nous expliquer ce qu'est Solidaris ?

Solidaris : *Le groupe Solidaris fait partie de l'Union Nationale des Mutualité Socialiste. Il compte en 2023 un effectif de plus de 5.250 collaborateurs en Belgique. En tant qu'organisme assureur, Solidaris assume la gestion de l'Assurance Maladie-Invalidité Obligatoire pour le compte de l'État belge. Solidaris occupe une position de leadership en tant que principale mutualité en Wallonie, comptant 1.356.000 affiliés. En tant que mutualité, Solidaris rembourse aux affiliées et aux prestataires de soins les dépenses en soins de santé, il octroie également des indemnités en cas de maladie. Solidaris propose également des produits d'assurance au travers de sa société mutualiste d'assurance (SMA) et bénéficie d'un vaste réseau socio-culturel et socio-sanitaire couvrant l'ensemble de la Wallonie.*

Pouvez-vous nous parler un peu de votre rôle et de vos responsabilités au sein de l'entreprise ?

Solidaris : *Le rôle de Directeur des Projets Digitaux fut instauré en 2016, à mon arrivée au sein de Solidaris. Ma mission consiste à superviser la transformation digitale de Solidaris à travers la conception, la mise en œuvre et la gestion de projets stratégiques. Dès fin 2016, j'ai établi un plan de transformation digitale, lequel demeure toujours en cours d'exécution en cette année 2023. Dans le cadre de ma direction, j'assume la responsabilité intégrale de l'ensemble des composantes de l'écosystème digital de Solidaris, englobant son site web, son portail connecté, l'application mobile ainsi que les bornes en agences. En outre, je supervise un Centre d'Excellence dédié à l'automatisation, contribuant à l'apport de solutions novatrices visant à accroître l'efficacité opérationnelle de Solidaris. Enfin, je participe activement à des groupes de travail orientés vers l'évolution des pratiques au sein de Solidaris, mettant en avant la prépondérance de l'agilité dans cette évolution.*

Comment l'entreprise définit-elle actuellement l'agilité et quelle est son importance dans sa stratégie ?

Solidaris : *Tout comme d'autres secteurs d'activités en Belgique, le seteur des mutualités est actuellement en proie à des mutations substantielles. L'avènement de nouvelles technologies, les ajustements des pratiques des affiliés, la simplification des procédures administratives, la régionalisation des soins de santé, les contraintes budgétaires ainsi que l'automatisation des flux, parmi d'autres facteurs, constituent les défis qui sollicitent notre attention. Au sein de Solidaris, la notion d'agilité organisationnelle se révèle cruciale dans la mesure où elle conditionne notre capacité à assimiler ces diverses contraintes, tout en conservant notre orientation stratégique sur le marché : celle de dispenser un service optimal à nos affiliés. Dès lors, l'agilité de notre entreprise s'affirme comme un enjeu stratégique majeur, c'est pourquoi plusieurs initiatives ont été démarrées pour rendre plus agile Solidaris.*

Quelles sont les principales initiatives ou projets agiles que l'entreprise a entrepris récemment ?

Solidaris : *Les premières initiatives ont concerné la manière de travailler des équipes IT. Je vais vous exposer deux illustrations concrètes. Une première initiative consiste à intégrer les méthodologies agiles Scrum et Kanban dans les projets orchestrés par la direction informatique. Cette démarche est toujours en cours, requérant un effort continu pour parvenir à son aboutissement, néanmoins, nos avancées sont palpables. Une seconde initiative repose sur l'utilisation d'outils de la suite Atlassian tels que Confluence et Jira, visant à renforcer le partage des connaissances et à soutenir les méthodologies agiles Scrum et Kanban au sein des équipes de produits et des projets.*

Comment l'entreprise mesure-t-elle le succès de ses initiatives agiles ? Quels indicateurs clés de performance sont suivis ?

Solidaris : *À l'heure actuelle, notre ensemble d'indicateurs demeure assez restreint, d'une part en raison de notre maturité limitée pour l'usage d'indicateurs sophistiqués, et d'autre part, du fait que les méthodologies agiles sont principalement mises en œuvre dans le contexte des produits et des projets informatiques. Pour ce qui est des autres pans de notre entreprise, il reste encore un ample chemin à parcourir. À titre d'exemple, nos indicateurs actuels englobent le taux d'adoption des méthodes agiles au sein de nos produits et services, le respect des cérémonies agiles ainsi que le niveau de documentation. Cependant, au niveau global de l'entreprise, nous avons également des indicateurs intéressants. Nous procédons*

régulièrement à l'évaluation d'indicateurs qui relèvent de la santé organisationnelle, tels que les enquêtes mensuelles de satisfaction menées auprès de nos affiliés, ou encore les enquêtes internes portant sur le bien-être de nos collaborateurs.

Que pensez-vous de votre score d'agilité de 58% ? Est-il étonnant ?

Solidaris : *Un score d'agilité de 58% suggère que Solidaris se positionne à un niveau modéré d'agilité organisationnelle. Cela sous-entend que certaines pratiques agiles sont effectivement mises en œuvre, mais que des améliorations demeurent nécessaires pour atteindre un niveau supérieur d'agilité. Ce n'est pas du tout étonnant et c'était un chiffre attendu. D'ailleurs, je m'attendais peut-être à pire, mais je finalement je suis satisfait de ce score.*

Qu'est-ce qui justifie, selon vous, la dégradation de votre sore brut 69% au score pondéré de 59% ?

Solidaris : *En examinant les résultats détaillés du test par dimension, il est perceptible que la dimension technologique joue un rôle déterminant dans le score pondéré. C'est sans doute pourquoi l'écart entre le score brut de 69% et le score pondéré de 58% se manifeste. Cette distinction est particulièrement remarquable au sein de Solidaris, où avec un score de 54% la dimension technologique affiche un niveau de progression moindre par rapport à son potentiel maximal que nous pourrions atteindre en généralisant les pratiques agiles au sein des produits et services informatiques.*

Je ne suis pas surpris du score faible de 53% pour la Culture d'entreprise. Solidaris est une société de plus de 100 ans, active dans le secteur des mutualités qui est un marché fermé, elle a donc une culture particulière qui a bien fonctionné par le passé mais qui nécessite une évolution. Cependant, il n'est pas facile de changer la culture d'une entreprise pour la rendre plus agile ….

Je ne suis pas étonné des scores de 77% de la dimension Personnes et 73% pour le Leadership. En effet, nos enquêtes internes mettent en lumière que notre personnel est assez motivé, qu'il a confiance dans l'entreprise et son management, qu'il partage les valeurs de l'entreprise. Et c'est vrai, notre personnel est fortement formé et présente grande diversité de genre, d'âge et d'origine.

Le score de 75% pour la dimension Organisation est très satisfaisant au regard des problématiques que nous rencontrons au quotidien… Je ne m'attendais pas à cette valeur. Peut-être que les indicateurs utilisés dans cette dimension ne sont pas suffisants que pour mesurer correctement

cette dimension. Il est vrai que nos enquêtes montrent que nos travailleurs sont contents de venir travailler et que nous offrons un environnement de travail agréable. Mais nous connaissons au jour le jour des problèmes liés au manque de communication entre équipe, ce qui me semble indispensable pour atteindre un bon niveau d'agilité de l'entreprise. Je pense que la méthode aurait profiter de garder cette mesure.
La dernière dimension, KPI opérationnel, n'est pas vraiment relevant pour une mutualité. Je comprends que cette dimension a une valeur pour les sociétés commerciales mais pas pour une mutualité. Nous recevons des frais d'administration de l'INAMI, ce n'est pas vraiment un chiffre d'affaires. Il aurait été plus parlant de parler de notre part de marché, qui est un indicateur plus approprié de notre capacité à attirer de nouveaux affiliés.

Qu'en retirez-vous comme pistes d'amélioration ?

Solidaris : *En tant de Directeur des Projets Digitaux, il m'apparaît évident que des mesures correctives spécifiques peuvent être mises en place pour améliorer notre niveau d'agilité, en fonction des domaines identifiés. J'ai déjà partagé le fait que des mesures sont déjà en cours dans le domaine des technologies, ce qui est inscrit dans le plan de transformation digitale. Compte tenu du rôle capital de l'agilité pour notre entreprise, je considère que les initiatives visant à renforcer notre organisation interne sont de première importance. Nous devons continuer à généraliser la gestion de projet agiles tels que Scrum ou Kanban, de constituer des équipes multidisciplinaires autoorganisées et d'encourager activement le processus d'amélioration continue. Enfin, étant donné la faiblesse observée dans la dimension culturelle, je suis d'avis que des actions stratégiques pourraient être envisagées. Il serait bénéfique de favoriser la collaboration et la communication ouverte entre les équipes. De même, il serait opportun d'encourager la prise de risque et l'innovation, afin de renforcer notre culture d'entreprise et d'accroître notre agilité organisationnelle dans son ensemble.*

Que pensez-vous du sujet de ce mémoire ?

Solidaris : *Ce sujet est vraiment dans l'air du temps, chez Solidaris et dans bien d'autres entreprise, et mérite d'y consacrer du temps. Si atteindre une agilité d'entreprise suffisante par rapport aux défis qui nous attendent était chose aisée, nous ne mettrions pas autant d'énergie et de temps pour l'atteindre. L'agilité d'entreprise est complexe, elle est un élément clé de la transformation numérique. Comme je l'ai déjà dit, en tant que*

directeur des projets digitaux, mon rôle consiste à conduire Solidaris à travers sa transformation numérique en adoptant des technologies et des processus modernes. Les initiatives de transformation numérique nécessitent souvent un changement culturel et organisationnel. Ce n'est pas aisé. L'agilité peut aider à faciliter ce changement en encourageant la flexibilité, la prise de responsabilité et l'ouverture au changement au sein de l'entreprise. Disposer d'une mesure du chemin parcouru vers l'agilité d'entreprise est une information importante pour toutes les entreprises, et du coup également pour Solidaris. Votre mesure est par conséquent une information à retenir.