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À L'OBTENTION DU TITRE DE DOCTEUR EN ADMINISTRATION - GESTION
DE PROJET

PAR
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EXPLORING THE MANAGEMENT OF PROJECT FRONT-END IN
HEALTHCARE DIGITAL TRANSFORMATION – A PROJECT DESIGN, GOAL,
AND CONTEXT PERSPECTIVES

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LIST OF ACRONYMS

BIDAF: Behaviorally informed decision architecture of a firm

CAQDAS: Computer-assisted qualitative data analysis software

CM: Committee of managers

DNA: Deoxyribonucleic acid

DT: Digital transformation

EHR: Electronic health record

HCDT: Healthcare digital transformation

HISs: Health information systems

HSM: Hard systems methodologies

HWF: Hanisch and Wald's project management research framework

IRR: Internal rate of return

IS: Information systems

IT: Information technologies

LBM: Lean business model

LTC: Long-term care

MOT: Management and organization theory

NPD: New product development

OA: Organization A

OB: Organization B

PESTEL: Political, economic, social, technological, environmental, legal

PFE: Project front-end

PM: Project management

PMIS: Project management information systems

SHS: Smart health system

SSM: Soft systems methodologies

SWOT: Strengths, weaknesses, opportunities, threats

TSU: Technology super user

TU: Technology user

VOC: Voice of customer

WG: Working group

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DEDICATION

It's been *Un parcours du combattant* – literally! First, thank you the Almighty God for your hand in this milestone.

Then, to you Liz, my Dear ½, I also dedicate this work for your *steady support* to my megaproject. And finally, to you, Boaz, Hiram, Caleb, and Miriam, though unclear about your exact contribution in this project, I also dedicate this essay. As my kids, you were automatically stakeholders, I deem you qualified - just giving you *the benefit of the doubt*.

Jean-Bosco Ntakirutimana

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This project has experienced multiples changes to its plan with approval from the responsible authority. So, thank you Dr Véronique Nabelsi for all kinds of *accommodation* that you have facilitated for me during this process in addition to ensuring a *close monitoring* for quality assurance purposes – goodness acknowledged.

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feel recognized for your contribution. Finally, during this prolonged process, I met many who have *helped me in one way or another*, and I take this opportunity to acknowledge their support. So, to all of you who identify with this category, receive my gratitude. Overall, the exercise was full of setbacks, but as the saying goes, it's the end that matters

– Tout est bien qui finit bien!

Jean-Bosco Ntakirutimana

SOMMAIRE DE LA THÈSE

Dans ce document, seul le générique masculin est utilisé juste pour en alléger le texte.

Traditionnellement, la technologie était conçue comme un moyen de réalisation de stratégie organisationnelle, mais avec le temps, cette conception a évolué, et aujourd'hui on la voit comme un facteur déterminant dans la formulation de stratégie. En lien avec cette évolution, le nombre de projets de transformation numérique a augmenté dans différents secteurs dont celui de soins de santé, le centre d'intérêt de cette recherche.

Cependant, entreprendre un projet est une dans différents secteurs y compris celui de soins de santé, entreprendre un projet est une chose et en tirer des bénéfices une autre pour diverses raisons, principalement, la mauvaise gestion de conception de projet. La gestion de conception de projet joue donc un rôle majeur dans le succès d'un projet mais, comme le montre la littérature, elle a été moins étudiée que la gestion de mise en œuvre de projet et cela constitue un paradoxe. Ce projet de recherche a été motivé par ce paradoxe et s'est réalisé en 2022 sous forme d'une étude de cas multiples pour explorer la manière dont les établissements de soins de santé situés dans la région de la capitale du Canada géraient la phase conceptuelle de leurs projets de transformation numérique.

Comme résultats de recherche, ce travail a révélé différentes choses entre autres, la phase conceptuelle de projet avec une structure plus raffinée que celle décrite dans la littérature et l'ignorance des répondants à propos de conception de projet, la nature multifactorielle du contexte de conception de projet, l'importance de stratégie organisationnelle et

d'aspects financiers dans la sélection d'un concept de projet, la dominance de l'innovation incrémentielle, et l'utilisation d'indicateurs quantitatifs dans l'évaluation des projets.

À propos de sa pertinence, cette recherche fait deux sortes de contributions, sur les plans théorique et pratique. Sur le plan théorique, sa contribution consiste en révélation sur la réalité de gestion de la conception de projet ainsi qu'en celle sur une relation symbiotique entre la gestion de projet et les théories de management et organisations. En révélant la réalité de gestion de la conception de projet, cette recherche fait progresser la maturité de gestion de projet en tant que discipline managériale et en révélant une relation symbiotique entre la gestion de projet et les théories de management et organisations, elle valide la notion d'enrichissement mutuel entre les disciplines.

Quant à sa contribution sur le plan pratique, cette recherche propose d'abord deux modèles complémentaires de gestion de la phase conceptuelle de projet, puis une liste d'outils et techniques utiles à la gestion de cette phase de projet et enfin, une réflexion sur le potentiel d'enrichissement mutuel entre la conception de projet et la gestion de programme.

Comme toute recherche, celle-ci a ses limitations, notamment, un nombre limité de répondants qui a négativement affecté la richesse des données. Cependant, l'impact négatif de cette limitation sur la qualité de ce travail devrait être négligeable étant donné que l'objectif de cette recherche visait la découverte d'un phénomène plutôt que la génération des résultats généralisables. Enfin, comme pistes de recherche ultérieure, la conception de projet pourrait être explorée davantage en se focalisant, par exemple, sur le leadership de projet et son rôle dans la performance de la phase conceptuelle de projet.

THESIS SUMMARY

Over time, the conception of digital technologies has evolved from the perspective of information technology strategy treating technology as a resource meant to support established business processes to that of digital business strategy viewing technology as a capability with the potential to shape the business scope. With such evolution, the number of digital transformation projects has increased, and this is obvious in various industries, including healthcare, the focus of this research. However, to undertake a project is one thing and to realize the expected benefits is another and many projects underperform for different reasons, mainly, the mismanagement of project conception. Compared to that of project implementation, the management of project conception has so far been under researched despite its determining role in project outcomes, and this is a paradox.

This research project was motivated by the above paradox, then conducted in 2022 as a multiple case study to explore how two public healthcare organizations based in Canada's capital region were managing the conception of their digital transformation projects.

As research results, this work has revealed a project front-end/project conceptual phase with a more refined structure compared to what is found in literature, little knowledge about this project phase among participants, the multifactorial nature of project front-end contexts, the importance of strategy statement and finances in the selection of a project concept, incremental innovation, and the use of quantitative indicators when evaluating projects

Regarding its relevance, this research makes two types of contributions, the contribution to the academic world and to the world of practice. The contribution to the academic world consists of the revelation about the reality of project conception management and the revelation of a symbiotic relationship between project management and management and organization theory. Through the revelation about the reality of project conception management, this research generates insights into project actuality, then advances the maturity of project management as a management discipline. In relation to the symbiotic relationship between project management and management and organization theory, this research validates the notion of a mutual enrichment between disciplines.

As for its contribution to the world of practice, this research proposes first, two complementary models for the management of the project conceptual phase, then a list of tools and techniques useful to the management of this project phase, and finally, a reflection on a potential mutual enrichment between project conception and program management.

As with any research, this work has its limitations, especially a limited number of research participants that has led to the collection of opinions with low variety. However, this research is still credible despite this limitation if seen as a study whose objective was to explore a phenomenon rather than to generate generalizable results. Finally, regarding directions for future research, project conception could be further explored from various angles, for instance, with focus on project leadership and its role in the performance of the project front-end.

SYNTHÈSE DE LA THÈSE

Cette section présente l'essentiel du contenu de cette thèse et comprend ces neuf sections :

i) Introduction

ii) Problème de recherche et sujets connexes

iii) Revue de littérature

iv) Cadre conceptuel de recherche

v) Méthodologie de recherche

vi) Résultats de recherche

vii) Discussion des résultats

viii) Contributions de recherche

ix) Conclusions

1. Introduction

L'homme a entrepris les projets pour atteindre différents objectifs, mais ce phénomène s'est intensifié à partir des années 1950 avec l'émergence de gestion de projet moderne et depuis lors les projets ont colonisé toutes les sphères de la vie humaine (Garel, 2013, Morris, 2013). Cependant, entreprendre un projet est une chose et en tirer les bénéfices escomptés une autre et cela se reflète dans l'insatisfaction des parties prenantes observée dans plusieurs projets (Davis, 2017). Les problèmes qui empêchent les projets de créer la valeur pour leurs bénéficiaires se côtoient dans tous les types de projets et sont principalement attribués à la mauvaise gestion de la phase conceptuelle de projet (Morris,

2013, pp. 60, 167, Samset, 2010, p. 31) et c'est sur ce processus managérial que cette recherche était focalisée.

En quoi cette recherche consistait-elle ; qu'est-ce qui l'avait motivé et en quoi sa pertinence consiste-t-elle ?

Cette recherche consistait en une étude qualitative de type exploratoire dont le but était de découvrir la réalité de gestion de la phase conceptuelle des projets de transformation numérique du secteur de soins de santé.

À propos de qui a motivé cette recherche, le choix du sujet a été influencé par trois facteurs. D'abord, l'ampleur de transformation numérique dans le secteur de soins de santé, puis, le lien entre les problèmes rencontrés dans la transformation numérique du secteur de soins de santé et la mauvaise gestion de ls phase conceptuelle de projet et enfin mon profil.

Au sujet du lien entre l'ampleur de transformation numérique dans le secteur de soins de santé et le choix de mon sujet de recherche, ce secteur figure parmi ceux qui ont largement embrassé la culture numérique (Kraus et al., 2021 ; Marques & Ferreira, 2020 ; Tripathi et al., 2020) et ce phénomène s'est intensifié avec l'éclosion de la pandémie de COVID-19 (Laberge et al., 2020 ; Yong, 2020, p. 2641). Cette transformation s'est manifestée à l'échelle globale et au Canada cela s'illustre par exemple par l'augmentation de 25% de téléconsultations en 2019 comparativement à la situation de l'année précédente (Canada Health Infoway, 2020 ; Digital Health Canada, 2020).

Par rapport au lien entre les problèmes rencontrés dans la transformation numérique du secteur de soins de santé et la mauvaise gestion de la phase conceptuelle de projet, le choix

de mon sujet de recherche se justifie par l'existence d'un grand nombre de tels problèmes. À ce propos, la littérature indique une variété de problèmes tels que le manque d'évolutivité et d'interopérabilité des technologies, une combinaison inadéquate des technologies et les problèmes relatifs à la sécurité de ces technologies (Abood et al., 2017 ; Hermes et al., 2020 ; Marques & Ferreira, 2020 ; Stephanie & Sharma, 2020).

Enfin, le lien entre le choix de mon sujet de recherche et mon profil, ce choix s'expliquerait par ma formation et mon expérience professionnelle. En effet, j'ai une formation de base en sciences de la santé ainsi qu'une expérience dans le domaine de soins de santé et ce profil a joué un rôle dans le choix de mon sujet de recherche.

Quant à la pertinence de cette recherche, elle consistait en besoin de découvrir la réalité de conception des projets de transformation numérique du secteur public de soins de santé. Concrètement, elle a révélé ce que reflétaient les concepts de projets sélectionnés comme valeur qui devait être créée par les projets ainsi que les facteurs organisationnels et contextuels qui jouaient un rôle dans la conception de projet. Enfin, elle a contribué à la gestion de programme en faisant quelques observations utiles à la pratique de cette discipline.

Somme toute, cette recherche s'inscrit dans la réponse aux appels qui ont été lancés pour explorer la réalité des projets et, par conséquent, contribuer à la maturité de gestion de projet, puis à l'augmentation de sa crédibilité parmi d'autres disciplines managériales (Cicmil et al., 2006 ; Geraldi & Söderlund, 2016 ; Maylor et al., 2008, p. S16).

2. Problème de recherche et sujets connexes

Toute recherche est censée découler de l'existence d'un problème – un problème de recherche - qui requiert une solution et dans cette étude, ce problème consistait en lacunes qui avaient été observées dans les connaissances sur la gestion de la conception des projets de transformation numérique du secteur de soins de santé.

Selon les revues de littérature sur les projets de transformation numérique du secteur de soins de santé on en savait assez sur ces projets sauf sur la gestion de leur phase conceptuelle qui était largement omise des publications (Ivančić et al., 2020; Kraus et al., 2021; Marques & Ferreira, 2020; Stephanie & Sharma, 2020). Les résultats de ces revues ont confirmé un paradoxe qui avait été observé une décennie plus tôt, un paradoxe qui consistait en ce que la phase conceptuelle de projet était moins étudiée que celle de la mise en œuvre alors que le résultat d'un projet était largement déterminé par sa conception (Samset, 2010, p. 8).

Cet état de connaissances sur la gestion de la phase conceptuelle de projet requérait donc une recherche comme celle-ci pour élucider ce processus avec une focalisation sur les trois dimensions de conception de projet – ses facteurs, son but et son contexte - et cela justifiait donc une étude comme celle-ci. Concernant les facteurs de conception de projet, la première lacune consistait en divergence d'opinions des auteurs à propos de l'organisation de cette activité c.-à-d. le nombre d'étapes dans lesquelles se déroulait la conception de projet. Une autre lacune consistait en manque de connaissances sur les outils et techniques qui étaient utilisés dans la conception de projet.

À propos de deux autres dimensions de conception de projet, la littérature n'indiquait pas ce que les concepts de projets sélectionnés reflétaient comme valeur à créer (objectif de conception de projet) et le contexte dans lequel se déroule cette conception (contexte de conception de projet).

Quant au but de recherche, cette étude se proposait de découvrir puis révéler la réalité de gestion de la phase conceptuelle du type de projet susmentionné et à cet effet, le problème de recherche a été traduit en cinq questions de recherche associées avec les trois dimensions de la conception de projet susmentionnées. Enfin, concernant la philosophie de recherche, cette étude s'inscrit dans le paradigme de réalisme critique, une perspective de recherche qui suppose la réalité d'un phénomène qui est indépendante du chercheur, mais dont la perception est influencée par le contexte dans lequel ce phénomène se manifeste.

3. *Revue de littérature*

Que savons-nous à propos de gestion de la conception des projets de transformation numérique du secteur de soins de santé et surtout quelles sont les lacunes dans les connaissances sur ce processus ? Indépendamment du type de projet et du secteur d'activité, la phase conceptuelle de projet se déroule dans un contexte de grande incertitude où les considérations politiques priment sur l'expertise technique avec une gestion perçue comme un art plutôt que de la science (Bohn, 1994, p. 67 ; Kim & Wilemon, 2002 ; Samset & Volden, 2016).

Concernant les lacunes dans les connaissances sur la gestion de la phase conceptuelle des projets de transformation numérique du secteur de soins de santé, la littérature sur ces

projets ne révèle pas grand-chose sur leur conception comparativement à ce qui a été publié sur d'autres phases surtout celle de leur mise en œuvre (Kraus et al., 2021 ; Marques & Ferreira, 2020 ; Stephanie & Sharma, 2020).

Comme ci-haut mentionné, on ne sait pas grand-chose sur le sujet de recherche de cette étude, mais par déduction les théories développées par certaines écoles de pensée en gestion de projet peuvent aider à élucider la conception de projets de transformation numérique du secteur de soins de santé. Vu la nature des activités qui lui sont associées et le contexte dans lequel elle se déroule, la conception des projets de transformation numérique du secteur de soins de santé peut être conceptualisée comme un processus sociotechnique et cognitif et aligné principalement sur cinq écoles de pensée en gestion de projet. Ces écoles sont l'école de décision (*The decision school*), l'école de gouvernance (*The governance school*), l'école de marketing (*The marketing school*), l'école de modélisation (*The modeling school*) et l'école de processus (*The process school*) (Turner et al., 2013).

i) L'école de décision *(The decision school)*

Cette école s'intéresse principalement à deux sujets – le traitement de l'information et la prise de décisions dans les projets. Les projets sont considérés comme un moyen de réduire l'incertitude dans une organisation (génération de l'information manquante à la suite de l'expérimentation d'idées à une petite échelle). Par rapport au deuxième sujet, cette école s'intéresse au phénomène de mauvaises décisions et aux facteurs qui mènent à ce phénomène. La phase conceptuelle de projet est connue pour son degré élevé d'incertitude

(Samset & Volden, 2016) ainsi que les biais cognitifs qui constituent un facteur majeur de mauvaises décisions (Kahnman et al., 2011 ; Sibony et al., 2017) et pour ces raisons l'école de décision peut éclairer les organisations dans leur processus de conception de projet.

ii) L'école de gouvernance *(The governance school)*

Cette école se focalise entre autres sur la gestion des parties prenantes d'un projet (Garland, 2009 ; Williams et al., 2010) et pourrait aider les organisations à comprendre tout ce qui concerne l'implication des parties prenantes dans la conception de projets.

iii) L'école de marketing (*The marketing school*)

En général, les projets se réalisent dans les organisations ou on trouve à la fois plusieurs concepts de projet qui cherchent le financement et une insuffisance de ressources. Pour obtenir l'appui dont ils ont besoin, ces concepts doivent se vendre à différentes parties prenantes de projet, notamment la haute direction de l'organisation pour obtenir des fonds nécessaires à la mise en œuvre du projet. D'après cette école, le marketing de projet est un facteur clé de succès d'un projet et les champions des projets doivent comprendre et tenir en compte les besoins de parties prenantes de projet durant tout le cycle de vie d'un projet, surtout pendant la phase conceptuelle.

iv) L'école de modélisation *(The modeling school)*

Cette école reconnaît le caractère sociopolitique des projets (Winter et al., 2006 ; Geraldi & Söderlund, 2016) et pourrait aider les organisations à mieux comprendre tout ce qui rapporte aux aspects humains dans la conception de projet. Cette école promeut une perspective de projet fondée sur la complémentarité des méthodes quantitatives

traditionnellement utilisées en gestion de projet avec les méthodes qualitatives considérées comme mieux indiquées pour la compréhension d'aspects humains des projets.

v) L'école de processus *(The process school)*

Cette école s'intéresse aux processus de gestion de projet, plus concrètement l'organisation des tâches basée sur le cycle de vie de projet et les notions connexes comme phases et étapes de projet (Kerzner, 2013 ; Samset, 2010) et pourrait éclairer les organisations sur la structure de la phase conceptuelle de projet.

Bref, la littérature sur les projets de transformation numérique du secteur de soins de santé ne couvre pas généralement la gestion de leur phase conceptuelle, mais différentes théories peuvent être utilisées comme tentative de combler les lacunes conceptuelles dans ce domaine.

4. Cadre conceptuel de recherche

Pour approcher un problème de recherche, un chercheur peut opter pour l'utilisation d'un cadre théorique/conceptuel ou y'aller *table rase*, selon l'école de pensée suivie à propos de la place accordée à la littérature au début d'une étude[1]. Cette étude s'est réalisée conformément à la première approche et était guidée par un cadre conceptuel de recherche à trois dimensions - les facteurs, le but et le contexte de conception de projet[2]. Cette approche a des avantages, mais comme revers de la médaille, elle peut mener aux observations biaisées lorsqu'un chercheur se laisse strictement guidé par son cadre

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[1] Thornberg (2012, p. 244)
[2] Cadre conceptuel adapté de Hanisch et Wald (2011, p. 9)

conceptuel. Dans ce travail, ce risque a été limité par une ouverture d'esprit pendant les phases de collecte et d'analyse des données.

La dimension de facteurs de conception de projet comprenait, entre autres, les activités qui étaient réalisées dans la conception de projet, les outils et techniques qui étaient utilisés dans ces activités et la manière dont ces activités étaient organisées (ordonnancement des tâches).

Quant à la dimension de but de conception de projet, elle correspondait à la valeur qu'un projet entendait créer (différentes formes d'innovation) tel qu'il était reflété dans les concepts de projet qui étaient sélectionnés.

Enfin, la dimension de contexte de conception de projet correspondait aux facteurs qui se trouvaient dans l'environnement d'un projet ou de l'organisation-mère d'un projet et qui influençaient la conception de projet.

Le cadre conceptuel utilisé dans cette étude s'est également inspiré d'un modèle générique de conception de projet qui organise cette activité en trois étapes – la génération d'idées de projet, le raffinement de ces d'idées et leur traduction en concepts de projet et enfin l'évaluation de ces concepts (Samset, 2010).

4. Méthodologie de recherche

Ce projet de recherche consistait en une étude de cas multiples de type exploratoire et concernant son unité d'analyse, elle était focalisée sur la gestion de la phase conceptuelle des projets de transformation numérique qui avaient été réalisés par les établissements de soins de santé du secteur public.

La collecte des données a été faite au moyen d'entrevues semi-structurées avec sept participants qui avaient participé dans six projets (cas étudiés) de deux établissements publics de soins de santé situés dans la région de la capitale nationale du Canada. Ces entrevues se sont réalisées par vidéoconférence en 2022 et chacune durait une heure en moyenne. Une étude peut se réaliser soit par une méthode de type probabiliste ou une méthode non probabiliste (Fortin & Gagnon, 2016) et celle-ci a utilisé l'échantillonnage par choix raisonné, une méthode non probabiliste dans laquelle le choix de participants est motivé par leur potentiel de fournir les données recherchées pour répondre aux questions de recherche.

Quant aux cas qui ont été étudiés, ils appartenaient aux catégories de projets de transformation numérique, de projets d'intégration et d'autres, tous vus comme processus de changement organisationnel à caractère sociotechnique. Concernant l'analyse des données, il existe différentes méthodes de codage des données (Saldaña, 2016) et deux types de codes – les codes prédéterminés et les codes émergents (Creswell & Creswell, 2018). Dans cette étude, cette analyse s'est réalisée au moyen de trois méthodes de codage des données - le codage conceptuel, le codage focalisé et la thématisation - et par une combinaison des codes susmentionnés.

La crédibilité de recherche peut être assurée par différents moyens, dont la triangulation des données (Yin, 2016) et dans cette étude cela s'est réalisé par trois modalités, nommément, la validation de mon interprétation des données auprès de participants, la triangulation des données par la comparaison des propos de participants et de l'analyse des

documents. Les documents analysés appartenaient à ces différentes catégories : les rapports annuels d'activités des établissements étudiés, les bulletins d'information internes des établissements, les rapports de recherche et les articles tirés de la presse locale.

5. *Résultats de recherche*

Que retenir de cette étude ? Comme mentionné ci-haut, cette étude se proposait de découvrir, puis révéler la réalité de gestion de la phase conceptuelle des projets de transformation numérique dans les établissements de soins de santé du secteur public et l'analyse des données a mené à l'émergence de cinq thèmes.

Premièrement, l'ignorance de la majorité des participants à propos de tout ce qui a trait à la phase conceptuelle de projet avec une critique de la gestion de cette phase due à ce qui était perçu comme un leadership autocratique. D'après ces participants, les technologies leur tombaient littéralement dessus et comme origine de ce problème, ils ont mentionné la conception des projets qui était dominée par les plus influents à l'exclusion de ceux qui étaient mieux indiqués pour déterminer le cours des choses.

Deuxièmement, l'énoncé de stratégie organisationnelle et les préoccupations financières comme facteurs clés derrière la prise de décisions majeures telle que la sélection de concept d'un projet. Explicitement, l'attrait d'un concept de projet était principalement associé avec son alignement sur la stratégie organisationnelle et sa faisabilité financière.

Troisièmement, la conception de projet comme processus façonné par un contexte multifactoriel. Concrètement, la conception de projet était influencée par les facteurs de

toutes sortes, y compris les facteurs politiques, économiques, sociaux, technologiques, environnementaux et légaux (PESTEL).

Quatrièmement, la conception de projet comme processus qui vise typiquement l'innovation de procédés et de modèles d'affaires de nature incrémentielle. Sur ce point, les cas étudiés étaient des projets qui avaient aidé les établissements à améliorer les choses dans le domaine de procédés ou celui de modèles d'affaires.

Enfin, le succès de projet considéré comme un phénomène mesurable. À ce sujet, pour lui accorder une certaine tangibilité, quiconque parle de succès de projet doit appuyer ses propos avec les indicateurs quantitatifs – une complémentarité des méthodes qualitatives et quantitatives dans la vie organisationnelle.

6. *Discussion des résultats*

Typiquement, toute étude doit s'inscrire dans la continuité des travaux antérieurs sur le même sujet (Øvretveit, 2008) et conformément à cette logique, cette section situe les résultats de mon étude par rapport à ceux des études antérieures.

Par rapport à la dimension de facteurs de conception de projet, cette étude a révélé une organisation d'activités en cinq étapes et cette organisation est plus raffinée que celle trouvée dans la littérature qui indique entre deux et quatre étapes (Gassmann & Schweitzer, 2014, p. 22 ; Morris, 2013, p. 164). Mais d'autres résultats relatifs à la même dimension de conception de projet comme l'association du leadership autocratique et l'insatisfaction des subalternes et l'ignorance de la phase conceptuelle par les gens s'expliquent par la

littérature et confirment donc les résultats des études antérieures (Goleman, 2000, p. 82 ; Samset & Volden, 2016, p. 298).

Toujours en relation avec la dimension de facteurs de conception de projet, la révélation par cette étude du rôle de l'énoncé de stratégie organisationnelle et des préoccupations financières dans la prise de décisions majeures par organisations s'explique par la littérature et ces résultats confirment également ceux des études antérieures (Mintzberg, 1987, p. 28 ; Lapuente & Van de Walle, 2020, p. 462).

En lien avec la dimension de contexte de conception de projet, cette étude a révélé l'effet des facteurs macro environnementaux sur cette activité et ces résultats sont en phase avec les publications qui montrent la perméabilité des projets et des organisations en général à leurs environnements (DiMaggio & Powell, 1983, p. 147 ; Kapsali, 2011, p. 400).

Par rapport à la dimension de but de conception de projet, cette étude a révélé l'innovation de nature incrémentielle dans les domaines de procédés et de modèles d'affaires et cela s'explique également par la littérature qui montre une préférence pour l'innovation incrémentielle par rapport à l'innovation radicale (Ringberg et al. ; 2019, p. 105). Toujours en lien avec la dimension de but de conception de projet, cette étude a révélé l'importance accordée à l'utilisation d'indicateurs quantitatifs dans la description des phénomènes organisationnels tel que le succès d'un projet et cela s'explique par l'influence du post-positivisme, une approche qui prône la complémentarité d'approches qualitatives et quantitatives dans différents domaines d'activités (Bohn, 1994, p. 74) ; Dumez, 2013, p. 30 ; Guba & Lincoln, 1994, p. 116).

7. Contributions de recherche

La contribution d'un projet de recherche se mesure par son rôle dans l'avancement des connaissances sur le plan théorique ou pratique (Van de Ven & Johnson, 2006) et celle-ci contribue à ces deux types de connaissances.

Sur le plan théorique, la pertinence de cette recherche consiste en deux choses, en l'occurrence, la contribution à la maturité de gestion de projet en tant que discipline managériale et l'illustration d'une relation symbiotique entre la gestion de projet et les théories générales de management et des organisations.

Concernant sa contribution à la maturité de gestion de projet, cette recherche constitue une réponse aux appels de la part de plusieurs auteurs qui demandaient plus de recherche empirique sur les projets pour savoir ce qui s'y passaient réellement (Blomquist et al., 2010 ; Cicmil et al., 2006 ; Geraldi & Söderlund, 2016, p. 777). Par rapport à ces appels, cette recherche révèle bien de faits dans la gestion de la phase conceptuelle des projets de transformation numérique réalisés par les établissements de soins de santé du secteur public, notamment, une phase de projet qui a une structure plus raffinée comparativement à la structure qu'on trouve dans la littérature. D'autres auteurs préoccupés par la maturité de gestion de projet ont recommandé une conceptualisation large des projets pour faciliter la communication interdisciplinaire (Winter et al., 2006, p. 645 ; Geraldi & Söderlund, 2016) ; à ce propos, cette recherche conceptualise les projets de transformation numérique entrepris par les établissements de soins de santé du secteur public comme un processus de changement organisationnel à caractère sociotechnique.

À propos de l'illustration d'une relation symbolique entre la gestion de projet et les théories générales de management et des organisations, cette recherche indique sept théories générales qui ont été pertinentes à mon projet de recherche et qui le seraient aussi dans les projets similaires. Dans cette relation, la gestion de projet mobilise les théories générales de management et des organisations théories pour fins de conceptualisation tandis que ces théories utilisent les projets comme contextes de leur validation (Maylor & Söderlund, 2015). En bref, la contribution théorique de cette recherche cadre avec le point de vue Maylor et Söderlund (2015, p. 13) qui distinguent trois manières dont la recherche en gestion peut avancer les connaissances. Ces trois modalités sont le raffinement des théories générales, l'extension du domaine d'application des théories et l'adaptation de ces théories aux contextes de recherche spécifiques. La contribution de cette recherche correspond aux deux premières modalités.

Sur le plan pratique, les contributions de cette recherche consistent en propositions qui portent sur quatre points : i) l'utilisation de modèle du processus étape-porte (*Stage-gate process mode*l) (Cooper, 2018, Kerzner, 2013) dans la gestion de conception de projet, ii) l'utilisation de modèle du système d'activité (Berghaus & Back, 2017 ; Kaptelinin, 2020) dans la conception de projet, iii) les outils et techniques utilisés dans la conception de projet, et enfin, iv) la pertinence de cette recherche à la gestion de programme.

8. *Conclusions*

Dans quelle mesure cette recherche a-t-elle atteint son but ; quelles sont sa pertinence, ses limitations et les pistes de recherche ultérieure ?

Concernant l'atteinte de son but, cette recherche a généré les connaissances pertinentes à une meilleure compréhension des trois dimensions de conception des projets de transformation numérique réalisés dans les établissements de soins de santé du secteur public – la dimension de facteurs, celle de but et celle de contexte.

Par rapport à la dimension de facteurs de conception de projet, cette recherche a révélé plusieurs choses, entre autres, une phase de projet plus raffinée que celle décrite dans la littérature et dont les activités et l'organisation sont ignorées par la majorité de participants.

En ce qui concerne la dimension de but de conception de projet, cette recherche a révélé l'innovation incrémentielle plutôt que radicale, un comportement conforme à la culture qui domine dans les établissements publics, celle d'une grande aversion au risque. Enfin, en ce qui a trait à la dimension de contexte de projet, cette étude a révélé la nature multifactorielle du contexte dans lequel se réalise la conception des projets.

À propos de la pertinence de cette recherche, les connaissances issues de ce travail seraient utiles aux différents domaines de gestion à cause d'une conceptualisation des phénomènes sous un angle large, un effort qui visait à établir les liens entre la gestion de projet et différentes théories générales. À titre illustratif, les projets de transformation numérique du secteur de soins de santé ont été conceptualisés comme des processus de changement organisationnel à caractère sociotechnique et pour cette raison, les résultats de cette recherche seraient utiles dans des contextes de recherche et de pratique similaires.

Pour ce qui est de ses limitations, cette recherche a souffert d'un nombre limité de participants et cela en a certainement affecté la qualité. Comme stratégie de mitigation de

ce risque, une triangulation des données a été réalisée sous forme d'analyse de documents, mais les résultats auraient été meilleurs avec un plus grand nombre de participants.

Enfin, comme pistes de recherche ultérieure, le sujet de recherche exploré dans cette étude pourrait l'être davantage avec deux méthodes de recherche – celle focalisée sur le processus et celle focalisée sur la variance[3]. La méthode focalisée sur le processus pourrait, par exemple, explorer le lien entre le leadership de projet pendant la conception de projet et la satisfaction des parties prenantes du projet avec la conception de projet. Quant à la méthode focalisée sur la variance, elle pourrait mesurer l'effet d'un style de leadership de projet utilisé pendant la conception de projet (variable exogène) sur la performance de l'organisation observée avec l'utilisation des livrables d'un projet (variable endogène). Concernant leur contribution, les résultats de ces études pourraient aider les organisations à créer les cadres de gouvernance efficaces, l'un des facteurs majeurs du succès de projet.

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[3] Orlikowski et Scott (2008, p. 438)

INTRODUCTION

To be of any help, a building needs a solid foundation, and so does any project – Author.

Over the years, organizations have increasingly relied on projects to achieve their goals – the projectification of society i.e., the colonization of society by projects (Hanisch & Wald, 2011; Jensen et al., 2016, p. 2). So, we have become a project society, and this phenomenon has intensified since the emergence of modern project management (PM) in 1950s (Garel, 2013, Morris, 2013) with projects contributing to the economy above 20% globally, and 30% in some emerging economies (Turner et al., 2013). However, project initiators do not always benefit from them, and project underperformance is a common phenomenon with 19% of projects considered as failures and 52% as challenged (Davis, 2017; Davis, 2018, p. 38). Why this phenomenon? These challenges have been attributed to different factors, mainly the mismanagement of the project front-end (PFE)/project conception (Morris, 2013, pp. 60, 167; Samset, 2010, p. 31). Project conception consists of a stage-gate process, i.e., undertakings with formal initiation and closure (Kerzner, 2013) and comprises three main stages, that is, the generation of project ideas, the elaboration of project concepts and the selection of a project concept destined for project implementation (Murphy & Kumar, 1997; Kim & Wilemon, 2002; Samset, 2010).

Issues traceable to the mismanagement of PFE have been found in various organizations and types of projects including healthcare digital transformation projects, the object of my inquiry. These issues include the lack of or inappropriate combination of technologies due

to the absence of an integrated approach to information technology (IT) investment, a factor that limits performance in 87% of organizations (Abood et al., 2017). Other factors for challenges in digital transformation projects include confusing methodologies linked to issues in 75% of projects (von Rosing & Etzel, 2020) and the lack of agility in project management linked to issues found in 70% of projects (Li, 2020).

As aforementioned, this research project was focused on the management of project conception in healthcare digital transformation (HCDT) and was motivated by two (2) main reasons – my educational background and the evolution of digital transformation (DT) across industries. In relation to my educational background, I took a course on health information systems (HISs) in Canada a decade ago and in a related coursework, I interviewed several healthcare practitioners to learn about their experience with the information systems (IS) that had been introduced into their workplaces. These practitioners shared with me the benefits of their systems as well as several issues including the resignment of some workers who have opted for early retirement rather than undergoing training to acquire IT skills and the lack of interoperability between IS within healthcare networks. To a large extent, the issues reported by these practitioners pointed to the mismanagement of project conception.

Pertaining to the evolution of DT across industries, several authors including Kraus et al. (2021), Laberge et al. (2020), Marques and Ferreira (2020) and Tripathi et al. (2020) have classified the healthcare industry among the most digitally transformed and their observations align with my experience. Actually, till the early 2000s, I was working as a

nurse in an environment where HISs were still in their infancy, and with such experience I am in a position to appreciate the extent to which HCDT has evolved.

Digital transformation in the healthcare industry has resulted from both planned initiatives and unexpected events such as the COVID-19 pandemic that, to many, has acted as a catalyst in this process: ''As the adage goes, *"every crisis represents an opportunity in disguise."* Our hospitals had talked about implementing telehealth for years. In the course of 1 week, all stakeholders came together to convert almost all cardiology visits to telehealth visits.'' (Yong, 2020, p. 2641). In Canada, the healthcare industry has remarkably advanced in terms of digital maturity, and this is reflected in the increase of telehealth consultations by 25% in 2019 compared to the previous year (Canada Health Infoway, 2020; Digital Health Canada, 2020). So, over the years, HCDT has intensified at the global level due to a variety of associated benefits including the quality of care, greater safety, reduced costs, reduced medical errors, increased efficiency of information flow and most importantly, empowerment of health care consumers in their health care decisions (Marques & Ferreira, 2020; Stephanie & Sharma, 2020; Kraus et al., 2021).

As reflected in literature reviews such as those conducted by Ivančić et al. (2020), Kraus et al. (2021), Marques and Ferreira (2020) and Stephanie and Sharma (2020), much has been published on HCDT. However, one aspect of this process, that is, the management of project conception has not received due attention compared to the management of project implementation, yet many issues found in DT are traceable to project conception. These issues consist of problems related to HISs lacking interoperability (Hermes et al., 2020;

Marques & Ferreira, 2020; Stephanie & Sharma, 2020), exclusion of technology intended users from project conception (Kraus et al., 2021), security and privacy (Hermes et al., 2020; Ivančić et al., 2020; Stéphanie & Sharma, 2020; Tripathi et al., 2020), and risk of harm in case of (medical) device hacking (Topol, 2019, p. 52). Also noted are concerns for scalability in e-health (Stephanie & Sharma, 2020) and the lack of/inappropriate combinations of HISs negatively impacting organizational efficiency (Abood et al., 2017; Tripathi et al., 2020). In sum, the management of the PFE in HCDT has received little attention so far despite the acknowledgment of the link between project conception and project outcomes, and this justified a study such as this whose goal was to discover the actual management of the project conceptual phase.

Regarding its contribution, this research has advanced research on project actuality, a line of inquiry in project management aimed at addressing gaps into knowledge about what is actually done in projects (Blomquist et al., 2010; Cicmil et al., 2006; Geraldi & Söderlund, 2016, p. 778) and has the potential to inform both practitioners and researchers interested in HCDT. Finally, it also contributes to the practice of program management.

The remainder of this document comprises eight sections and proceeds as follows: research problem and related matters, literature review, research conceptual framework, research methodology, research results, discussion of research results, research contributions, and conclusions.

NEXT CHAPTER – RESEARCH PROBLEM AND RELATED MATTERS

- RESEARCH PROBLEM

- RESEARCH GOAL

- RESEARCH QUESTIONS

- RESEARCH PARADIGM

- SOMMAIRE DU CHAPITRE

CHAPTER 1 - RESEARCH PROBLEM AND RELATED MATTERS

This chapter focuses on my research problem, i.e., what has motivated my research and related matters and comprises five sections: research problem, research goal, research questions and research philosophy.

1.1. RESEARCH PROBLEM

Rather than for the sake of it, research is conducted to solve real problems, and this research project conformed to this principle. So, what was out there to problematize in this project? As aforementioned, the literature on project front-end management has shown several paradoxes and unsettled matters and this section returns to these in an elaborate way.

> […] It is therefore a paradox that most of the curriculum and textbooks for students in the profession termed Project Management focus on how to manage a project during the implementation phase, while the problem of how to systematically arrive at better project concepts up front is largely neglected (Samset, 2010, p. 8).

In different domains of inquiry, knowledge generally increases over time, but this has not yet materialized regarding the management of project conception in healthcare digital transformation and the above quote is still valid more than a decade later in this project domain. Concretely, the literature on project front-end management in healthcare digital transformation including systematic reviews (Ivančić et al., 2020; Marques & Ferreira, 2020; Stephanie & Sharma, 2020; Kraus et al., 2021) still shows knowledge gaps in three

aspects of project conception, that is, the project front-end design, the project front-end context and the project front-end goal (Figure 1.1).
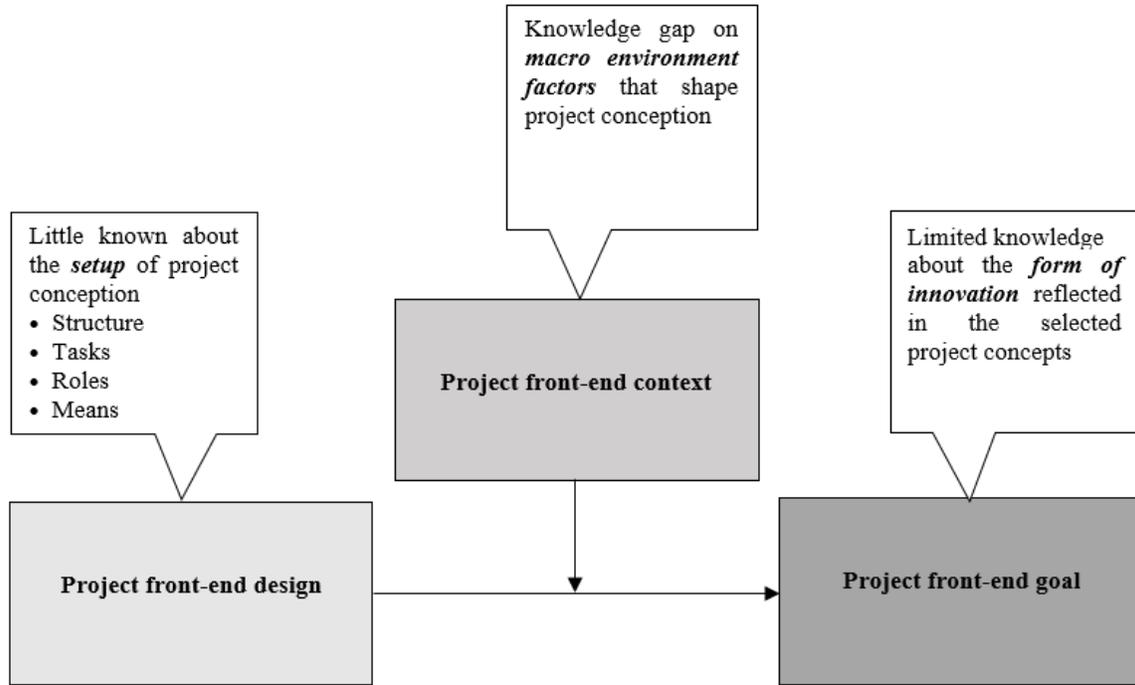
Figure 1.1. Research problem

Based on Hanisch and Wald's (2011) project management research framework (HWF), the project front-end design can be seen as the initial setup of factors under control of a project's parent organization (resources, project structure etc.) required to achieve a project goal (Hanisch & Wald, 2011). As to the project front-end context, it refers to extra organizational factors that can influence project conception. Finally, the project front-end goal is the kind of innovation pursued by an organization and reflected in the concept selected at the end of the project conceptual phase.

In relation to the knowledge gap in the literature on the project front-end design, issues requiring investigation related to the structure of project conceptual phase in addition to tools and techniques used in this project phase. Regarding its structure, PFE has been described as a project phase with a varying number of stages associated with the level of project risk. So, to some, the PFE comprises two stages (Cooper, 2008, p. 4; Kerzner, 2013, p. 78) or three stages (Murphy & Kumar, 1997, p. 8; Samset, 2010, p. 161) while others advance between two and four stages (Gassmann & Schweitzer, 2014, p. 22; Morris, 2013, p. 164).

Concerning tools and techniques, their availability is one thing, and their utilization is another. Besner and Hobbs (2006, p. 43) classify PM tools and techniques in two (2) categories, that is, super tools, i.e., tools extensively used, therefore seen as having a high intrinsic value, and discredited tools, i.e., deemed useless, therefore with little intrinsic value. In the same vein, as reported by project managers in a large-scale survey by Patanakul et al. (2010, p. 51), only two out of ten (20%) tools and techniques used in the project conceptual phase were contributing to project success. In general, project managers used particular project management tools and techniques for other reasons than their usefulness such as their habit, the popularity of those tools and techniques and the need to comply with standard processes of their organizations. In short, the structure of the PFE, PFE's tools and techniques in different undertakings including HCDT have so far received little attention, and these knowledge gaps warranted an inquiry such as this.

In relation to the knowledge gap in the project front-end context, several systematic reviews (Ivančić et al., 2020; Kraus et al., 2021; Marques & Ferreira, 2020; Stephanie & Sharma, 2020) have identified factors for healthcare digital transformation with regulations about the protection of patient information, national economy, the existence of reliable technologies, consumerism in health care and the role of government cited among the most important. These reviews have provided some useful knowledge on project context, but they did so in an unstructured way with none of them focused on the project front-end, and this represented room for contributions to knowledge in this area. So, to address this issue, I have explored the context of the project front-end with a conceptual framework widely accepted and used for investigating organizational environments, a six-dimension framework covering political, economic, social, technological, environmental, and legal (PESTEL) factors (O'Shaughnessy, 2006; Whittington et al., 2020).

Finally, concerning knowledge gaps in the literature on the project front-end goal, the above literature has not provided details on the kind of innovation that was associated with healthcare digital transformation, yet projects are generally meant to bring about innovation (Hanisch & Wald, 2011; Morris, 2013) and this also represented room for inquiry. Innovation can be described in different ways and based on its magnitude, it can be seen as either an incremental or radical innovation and based on its form, as a product, service, process, or business model innovation (Crossan & Apaydin, 2010). The goal of the project front-end is the generation of a project concept destined for project implementation and reflects the kind of innovation sought by an organization. In brief, the

literature on healthcare digital transformation has not characterized the innovation associated with this process, and the concern for conceptual clarity justified a study such as this to address this issue. Moreover, the notion of project goal brings to the fore the phrase "project success" to which people generally attribute different meanings (Chang et al., 2013; Davis, 2018; Ika, 2009; Liu & Walker, 1998, p. 213) and there was also a need to discover its connotation.

In short, as illustrated in Table 2.1, little has been published on the management of project conception in healthcare digital transformation. Concretely, I have identified several knowledge gaps in the literature on three dimensions of the project front-end, that is, the project front-end design, the project front-end context, and the project front-end goal, and this called for an inquiry such as this to address these gaps.

1.2. RESEARCH QUESTIONS

Research questions proceed from a research problem, and as such, constitute the hub of research design (appendix 7) i.e., the central component of research design connected most directly to its other components (Maxwell, 2013, p. 4). So, to address the knowledge gaps highlighted in my research problem, I have undertaken a series of activities starting with the formulation of the following five (5) questions:

1. *Regarding the project front-end design, what is the structure of the project front-end, activities, and means used; how do project stakeholders rate this process and why?*

2. *In connection with the project front-end design, what principles do organizations follow when selecting project concepts or making any other big decisions?*

3. *Pertaining to the project front-end goal, what form of innovation do selected project concepts reflect?*

4. *Pertaining to the project front-end goal, what does project success mean to different stakeholders?*

5. *In relation to the project front-end context, what are extra organizational factors that shape the project front-end?*

1.3. RESEARCH GOAL

As mentioned in the previous section, research had identified several knowledge gaps on the management of project conception in healthcare digital transformation and this warranted exploratory research with the following threefold goal:

1. To discover the reality of the project front-end design, i.e., organizational factors that influence project conception

2. To discover the reality of the project front-end context i.e., extra organizational factors that influence project conception

3. To discover the kind of innovation reflected in the selected project concepts

1.4. RESEARCH PHILOSOPHY

To ensure the clarity of their works and consequently spare themselves unnecessary critiques, it is advisable for a researcher to spell out their research paradigm i.e., philosophical assumptions or worldviews underpinning their inquiries (Gauthier & Ika, 2012, p. 6; Guba & Lincoln, 1994, p. 116;). So, in this section, I briefly discuss critical realism, the philosophical foundation of my research. Regarding ontology (the nature of reality) and epistemology (knowledge about reality), critical realism assumes an

ontological realism and an epistemological relativism or constructivism, respectively (Gauthier & Ika, 2012; Guba & Lincoln, 1994; Johnson & Duberley, 2000).

Ontological realism also known as "being ontology" refers to a reality that exists independently of human agency i.e., human knowledge, perception, discursive conventions, beliefs, etc. – a reality to be found "out there" (Guba & Lincoln, 1994; Johnson & Duberley, 2000; Gauthier & Ika, 2012). As for epistemological relativism or constructivism, it assumes the possibility for people to have different narratives when referring to the same reality (Guba & Lincoln, 1994; Johnson & Duberley, 2000; Maxwell, 2013).

Critical realism is a paradigm that links observed events in cause-effect relationships with real non-empirical deep structures i.e., underlying causal powers or causal generative mechanisms with people's perceptions and beliefs considered as shaped by their assumptions and experiences as well as by the reality with which they interact (Johnson & Duberley, 2000, p. 154; Maxwell, 2013, p. 43). Ontological realism and epistemological relativism seem incompatible, but their combination in critical realism can be understood as a modality of bricolage - an approach to research consisting in using whatever is at hand to achieve one's goal with pragmatism prevailing over any philosophical beliefs (Maxwell, 2013, p. 43).

According to Johnson and Duberley (2000, p. 154), critical realism provides causal explanation of phenomena through the exploration of mechanisms that constrain or facilitate cause-effect relationships and for this reason, it is a suitable philosophical

framework in a study aimed at investigating context-dependent input-output processes such as DT projects. This view is supported by Smyth and Morris's (2007) observation on the suitability of critical realism as a research paradigm in project management given the moderating effect of contextual conditions on causal forces. For instance, the selection of a project concept results in an indisputable output (selected project concept) but, there can be a disagreement on the merit of this concept among project stakeholders. In this case, every person knows what has been selected as a project concept (ontological realism), but people may disagree on the quality of that concept or the quality of the process that has led to its selection (epistemological relativism or constructivism).

In information system projects, it is common for stakeholders in the same project to see things differently when looking at the same project aspect (Janssen et al., 2015), a phenomenon seen as normal from the perspective of critical realism as a research paradigm. Based on the nature of my research subject, I have anticipated divergent opinions about the same phenomena in my findings and this played in favor of critical realism as a philosophical foundation of research seen as compatible with such opinions. So, my study was founded on critical realism as a research paradigm.

1.5. SOMMAIRE DU CHAPITRE 1 – RESEARCH PROBLEM AND RELATED MATTERS

Typiquement, toute recherche est motivée par un problème qui requiert une solution et le problème à l'origine de ce travail consistait en lacunes qui se trouvaient dans la littérature sur la gestion de la conception des projets de transformation numérique du secteur public de soins de santé. Concrètement, il y avait peu de connaissances sur les trois dimensions de conception de projet – les facteurs, le but et le contexte de conception de projet. À propos des facteurs de conception de projet, les auteurs divergeaient d'opinions sur l'organisation de cette activité c.-à-d. le nombre d'étapes dans lesquelles se déroulait la conception de projet. Une autre lacune consistait en manque de connaissances sur les outils et techniques qui étaient utilisés dans la conception de projet.

À propos de deux autres dimensions de conception de projet, la littérature n'indiquait pas ce que les concepts de projets sélectionnés reflétaient comme valeur à créer (le but de conception de projet) et le contexte dans lequel se déroule cette conception (contexte de conception de projet). Quant au but de recherche, cette étude se proposait de découvrir puis révéler la réalité de gestion de la phase conceptuelle du type de projets susmentionnés et à cet effet, le problème de recherche a été traduit en cinq questions de recherche associées avec les trois dimensions de la conception de projet susmentionnées.

Enfin, concernant la philosophie de recherche, cette étude s'inscrit dans le paradigme de réalisme critique, une perspective de recherche qui suppose la réalité d'un phénomène qui est indépendante du chercheur, mais dont la perception est influencée par le contexte dans lequel ce phénomène se manifeste.

NEXT CHAPTER - LITERATURE REVIEW

- LITERATURE REVIEW METHOD

- DIGITAL TRANSFORMATION

- 10 CONCEPTS RELEVANT TO PROJECT FRONT-END MANAGEMENT

- SOMMAIRE DU CHAPITRE

CHAPTER 2 - LITERATURE REVIEW

The literature review is an exercise meant to present the essence of what is known and most importantly what is unknown about a research subject and consequently show the relevance of a further inquiry (Lingard, 2018, p. 47). This research takes place in a context where the physical and the digital worlds are increasingly fusing in all aspects of life (Laberge et al., 2020, p. 2) and this chapter covers the essence of knowledge relevant to my research subject - the management of the project front-end/project conceptual phase in the context of healthcare digital transformation. The chapter comprises three (3) sections and proceeds as follows: the literature review method, key notions about digital transformation, and concepts relevant to the management of the project front-end.

2.1. LITERATURE REVIEW METHOD

To know the state of knowledge on this subject, I have searched different databases for articles treating the management of project conception in healthcare digital transformation. This search was mainly conducted in the five (5) following databases based on their reputation and potential to contain relevant publications in the context of my study:

- Scopus

- Web of Science

- Academic Search Complete

- ACM Digital Library

- Google Scholar

As search strategies, I have used different terms including the following:

- "health*" AND "digital transformation" OR "digitalization"

- "healthcare" AND "digital transformation"

- "digitalization" AND "healthcare"

- "digitalization" AND "healthcare" AND "manag*"

Regarding the period covered by this search, it spans more than two decades i.e., from 2000 to 2023, the beginning corresponding to the point at which the term digital transformation emerged in the literature (Gong & Ribiere, 2021, p. 5). This search took place, mainly from May 2020 to June 2023 and as illustrated in Table 2.1, it has revealed little knowledge on the management of project conception in the context of healthcare digital transformation.

Search term	Database searched[4]	Retrieved articles[5]	Abstracts read[6]	Retained articles[7]
"health*"AND"digital transformation" OR"digitalization"	Scopus	137	10	0
"health*"AND"digital transformation" OR"digitalization"	Web of Science	178	0	0
"healthcare"AND "digital transformation"	Academic Search Complete	134	8	0
"digitalization"AND "healthcare"	ACM Digital Library	367	3	0
"digitalization"AND "healthcare"AND "manag*"	Google Scholar	~ 8,890	2	0

Table 2.1. Literature review method

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[4] Covered period: 2000 - 2023

[5] For ACM Digital Library and Google Scholar, title reading was limited to 200 top articles sorted by relevance

[6] Abstract reading was motivated by the content of articles' titles

[7] Publications treating project conception in healthcare digital transformation

As mentioned, virtually nothing had been published on the object of my inquiry - the management of the project front-end in healthcare digital transformation - and as a strategy to deal with this knowledge gap, I turned to the literature on schools of thought in project management in the search for publications that could be related and relevant to my research subject. In this process, I found different taxonomies of schools of thought in project management and then chose Turner et al.'s (2013) that served me afterward as a pointer to the kind of knowledge that I was looking for, i.e., knowledge that could be relevant to the management of the project front-end in healthcare digital transformation.

The project front-end has been described as the most creative and uncertain phase in a project life cycle characterized by issues related to power, politics, conflict of interest, and self-interest among others (Kim & Wilemon, 2002, Samset & Volden, 2016) and these characteristics align its management with the perspectives of some schools of thought in project management (Turner et al., 2013). Concretely, the ten (10) concepts presented in this chapter are rooted in the five (5) following schools: the decision school, the governance school, the marketing school, the modeling school, and the process school.

i)   The decision school – the project as a computer (concepts 2.3.1; 2.3.6)

The decision school views a project as a tool to process information for decision-making in projects and focuses on factors behind decisions throughout a project life cycle – factors related to project initiation, approval, and funding of projects besides those behind project completion, termination and conclusions about project success or failure (Turner et al., 2013). This school has investigated issues such as project disasters, what caused them and

whether they were preventable. It is also interested in cognitive issues such as sunk cost fallacy, optimism bias and political bias, and the associated (biased) decisions like escalating commitment to failing projects, defending optimistic estimates, cost underestimation, etc.

The decision school mainly uses soft systems methodology (SSM) and pays particular attention to the project front-end, which is known for fuzziness due to a high level of ambiguity and uncertainty in its environment.

ii) The governance school – the project as a legal entity (concept 2.3.8)

As to the governance school, it focuses on mechanisms meant to help those undertaking a project to benefit from it through the establishment of rules for effective project decision-making (Turner et al., 2013). These rules cover the entire project life cycle and guide decisions among others in the determination of project objectives, processes for project implementation, roles, responsibilities, and relationships between project stakeholders, and processes for project monitoring and control. So, looking at project front-end management from this school's viewpoint could help in better understanding this process.

iii) The marketing school – the project as a billboard (concept 2.3.4)

In general, organizations constitute environments where multiple project concepts compete for limited resources and to succeed, a project needs to effectively sell itself to various stakeholders, especially the top management to get funding (Elbanna, 2013, p. 284; Flyvbjerg, 2006, p. 6). This school sees project marketing as a key project success factor,

and for this reason project champions need to understand and consider the needs of project stakeholders throughout the project life cycle, especially during the conceptual phase.

iv)   The modeling school – the project as a mirror (concepts 2.3.2; 2.3.5)

The modeling school seeks to address the limitations of the optimization school in managing project social aspects. To this end, it complements hard systems methodologies (HSM) of the optimization school with soft systems methodologies (SSM) (Turner et al., 2013) and transcends the issue of project hardness/softness dichotomy[8]. It helps organizations effectively manage their projects by making sense of, then address organizational, behavioral, and political issues found in project environments.

v)   The process school – the project as an algorithm (concepts 2.3.3; 2.3.7; 2.3.9; 2.3.10)

The process school views projects as a means by which organizations achieve their objectives through a series of activities that translate project concepts into project deliverables. This school focuses on the definition of structured processes from project conception to project completion and the project is like an algorithm that helps an entity solve the problem of how to achieve its objectives (Turner et al., 2013). According to the process school, project management is a structured process that helps an entity to convert its vision into reality, a road map which takes it from the start to the desired end state. In this school, the project life cycle constitutes the central concept, an organizing device for project management processes.

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[8] Appendix 5; Karrbom Gustavsson and Hallin (2014)

Concept	Definition	Authors
Causal mechanisms in projects	In a project, the effect of a causal force depends on contingencies	Hanisch and Wald (2011); Smyth and Morris (2007)
Creativity, innovation, and project font-end	The project front-end is an informal and creative phase with high impact on organizational innovation	Isaacson (2012); Kim and Wilemon (2002); Leipzig et al. (2017); Woodman et al. (1993)
Digital maturity	The extent to which an organization has transitioned from analog to digital modality in its operations	Kane et al. (2019); Luftman, and Kempaiah (2007); Schwertner (2017); Westerman et al. (2014)
Digital transformation benefits	Improvement of performance in product, service, process and/or business model area following digital innovations	Barthel and Hess (2019); Schwertner (2017); Westerman et al. (2014)
Digital transformation issues traceable to the ineffective management of the project front-end	-Lack of efficiency due to inappropriate combination of technologies -Threats to security and privacy -Lack of interoperability of HIT -Lack of technology scalability -Lack of skills, project scope, top management support, process alignment, risk management -Incompatibility between new IT and legacy systems -Bias in datasets used to train AI	-Abood et al. (2017); Tripathi et al. (2020) - Stephanie and Sharma (2020); Topol (2019) -Hermes et al. (2020); Marques and Ferreira (2020) -Stephanie and Sharma (2020). -Schönberger and Čirjevskis (2017) -Ebad (2020) -Topol (2019)
Digital transformation life cycle	6 stages: initiation, adoption, adaptation, acceptance, routinization, and infusion	Brown et al. (2007)
e-health benefits	Quality of care, greater safety, reduced costs, reduced medical errors, increased efficiency of information flow and most importantly, empowerment of health care consumers in their health care decisions	Kraus et al. (2021); Marques and Ferreira (2020); Stephanie and Sharma (2020)
Project as a cognitive concept	Cognitive biases lead to bad decisions and this calls for the decision architecture of a firm – a set of principles on which an organization has to base its decisions	Finkelstein (2003) ; Kahneman et al. (2011) ; Sibony et al. (2017)

Project as a social concept	Projects as a complex adaptive systems or processes characterized by social interactions, interests, hidden agendas, politics, power, non-linearity, emergence, dynamic behavior, and self-organization	Hanisch and Wald (2011); Janssen et al. (2015); Mowles (2010); Williams et al. (2010); Winter et al. (2006)
Project as a technical concept	Projects as mechanistic processes relying on the use of tools and systems	Kerzner (2013); Turner et al. (2013)
Project front-end stages	1. Identification of project concepts 2. Elaboration of project concepts 3. Assessment of project concepts	Murphy and Kumar (1997); Samset (2010)
Project management vs Project governance	-Project management: processes established to organize and manage resources required to complete a project within a defined time, cost, scope, and quality constraints - Project governance: A framework created by a project sponsor with broad guidelines on how a project is to be undertaken by defining elements of a project management methodology including tasks, roles, artifacts, tools, and techniques - depending on what matters most to them.	-Samset and Volden (2016) -Miller and Hobbs (2005); Williams et al. (2010)
Project outcomes	-Tactical project success: efficient project delivery -Strategic project success: long-term benefits for the entire society	Chang et al. (2013); Ika (2009); Samset (2010); Samset and Volden, (2016)
Steps to digital business model	1. Digitization 2. Digitalization 3. Digital transformation	Bloomberg (2018); Gartner (2020); i-Scoop (2020); Ritter and Pedersen (2020)
Uncertainty in the project front-end	The earlier the project phase, the higher the uncertainty level (the project front-end is characterized by a high level of uncertainty)	Alam (2006); Atkinson et al. (2006); Kim and Wilemon (2002); Samset and Volden (2016)

Table 2.2. Concepts relevant to project front-end management

The above table is based on Turner et al.'s (2013) schools of thought in project management.

2.2. DIGITAL TRANSFORMATION

This section covers the following notions: the definition of digital transformation, steps to digital transformation, digital business model, digital transformation life cycle, digital maturity model, and approaches to the initiation of digital transformation.

What is digital transformation and what motivates it? Digital transformation is a major organizational change – with an impact on at least the department level – following the introduction of digital technologies meant to improve performance in product, service, process, or business model area (Barthel & Hess, 2019, p. 11; Kane et al., 2019; Schwertner, 2017; Westerman et al., 2014).

2.2.1. Steps to digital transformation

This section explains basic notions in the process of digital transformation (figure 2.2).
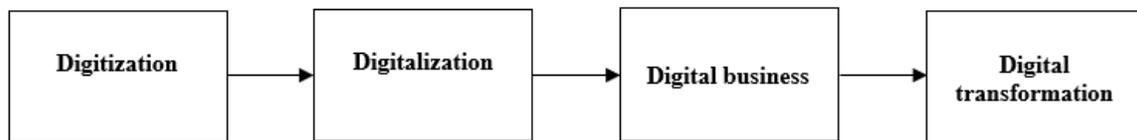
Figure 2.1. Steps to digital transformation (Author after Bloomberg, 2018; i-Scoop, 2020)

Digital transformation is the last step of organizational change enabled by the use of digital technologies, consecutive to three (3) processes, that is, digitization, digitalization, and digital business (i-Scoop, 2020). Digitization consists in transforming data from an analog or physical format to a digital one or the computer language i.e., representing real-world things by specific sequences of binary digits (numbers 0 and 1) so that computers can store, process, and transmit them with the ultimate goal to improve the organization's performance (Bloomberg, 2018; Ritter & Pedersen, 2020). Based on data origin, i-Scoop

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(2020) classifies data into two (2) categories - digitized and digitally born data. Digitized data result from converting and/or representing analog or physical things such as environmental signals, and documents to a digital format (Ritter & Pedersen, 2020; i-Scoop, 2020). As for digitally born data, they are obtained by collecting original data with digital technologies (i-Scoop, 2020).

As for digitalization, it is a concept with multiple interpretations. According to Ritter and Pedersen (2020), digitalization consists of the use of digital technology applications to improve business performance. The second conception of digitalization presents it as a road from digitization towards digital transformation or the creation of an environment deemed conducive to a digital business model (i-Scoop, 2020). As to digital business, it is a business in which the digital and the physical worlds are blurred (Gartner, 2020).

Finally, as the culmination of this process, digital transformation is the stage in which digital becomes a way of life as a result of a digital culture that permeates the entire organization (Kane et al., 2019). From the perspective of strategic management, this culture leads to and is reinforced by the replacement of IT strategy, i.e., the conception of digital technologies as a means to support established business processes with digital business strategy (DBS), a viewpoint from which these technologies are seen as having the potential to shape business scope (Bharadwaj et al., 2013). Regarding business scope, it refers to the portfolio of business offerings and related activities realized within the direct control of an organization (Bharadwaj et al., 2013). According to i-Scoop (2020), the concepts of

digitalization and digital transformation are often used interchangeably, and for practical purposes, they are used as such in this study.

2.2.2. Digital transformation life cycle

This section presents Brown et al. (2007) model of the digital transformation life cycle and its correspondence with Samset's (2010) project life cycle.

According to Samset (2010, pp. 29, 34), a project life cycle can be viewed from two perspectives, i.e., a tactical and a strategic perspective (appendix 6). A tactical perspective of project management is a view of a project just concerned with efficiency in its delivery, that is, the creation of project outputs within three traditional project management constraints - cost, time, and scope. A strategic perspective of project management is a broader view of project concern with the choice of the right project concept, efficient project delivery, and project benefits. In this section, the project life cycle refers to the strategic perspective of project management and comprises three phases, namely, the project front-end/front-end of a project or the project conceptual phase, the project implementation phase, and the project operational phase.

Project front-end (PFE) or the project conceptual phase is a project phase comprising a series of activities from the generation of project ideas to the approval, then funding of a project concept destined for development during the project implementation phase. As to the *project implementation phase,* it is a project phase concerned with detailed planning and the creation of project deliverables. Finally, the *project operational phase* is the project

phase during which project benefits are/are supposed to be realized through the exploitation of project deliverables by a project client.

Regarding digital transformation life cycle, Brown et al. (2007) proposes a process life cycle with six stages - initiation, adoption, adaptation, acceptance, routinization, and infusion stage.

The *initiation stage* consists of the identification of organizational problems or business opportunities, on the one hand, and IT solutions, on the other hand, then matching them. As to the a*doption stage*, it is concerned with the search for organizational support to get resources needed to implement the IT solution selected in the initiation stage. Regarding the a*daptation stage*, it consists of the installation of a technology and the modification of organizational routines to ensure benefits from the new system. At the end of this stage, the new system is ready for use. The *acceptance stage* corresponds to the time when technology intended users start to use a system and the *routinization stage* to the point when the project leadership encourages people to use the new system. Finally, the *infusion stage* refers to the period during which an organization realizes the expected project benefits.

Regarding correspondence between these two (2) types of a process life cycle, the initiation and adoption stages of DT life cycle correspond to the PFE of the project life cycle. As for the adaptation stage of DT life cycle, it corresponds to the implementation phase of the project life cycle. Finally, the last three stages of DT life cycle, that is, the acceptance,

routinization, and infusion stages correspond to the project operational phase of the project life cycle.

2.2.3. Digital maturity model

Digital maturity is the ability of an organization to adapt to digital trends in its environment determined by the institutionalized (digital) culture i.e., people's behaviors, underlying assumptions, and artifacts (Kane et al., 2019). Digital maturity has been conceived as a continuum with organizations falling in one of five groups (Luftman & Kempaiah, 2007; Leipzig et al., 2017) or in one of three groups - early, developing, and maturing organization - (Kane et al., 2019) based on how far they have progressed in their digital transformation. Digital transformation is a sociotechnical process and as such, its success requires the balance of two (2) complementary factors, that is, digital intensity i.e., the investment in digital technologies and transformation management intensity i.e., the management of organizational change process (Luftman & Kempaiah, 2007; Westerman et al., 2014; Kane et al., 2017).

In brief, low digital maturity is typically associated with a piecemeal conception of digital transformation and high digital maturity with a more integrated approach to this process due to an innovation and digital thinking culture (Abood et al., 2017; Leipzig et al., 2017; Luftman & Kempaiah, 2007; Kane et al., 2019). Explicitly, a piecemeal conception of digital transformation results in the lack of technology complementarity and the limitation of benefits from this process to a few units of an organization. At the opposite end of the continuum, high digital maturity has been associated with a strong digital culture.

Based on their multi-year and large-scale survey, Kane et al. (2019) have described this culture as a phenomenon characterized by the following six traits: first organization's agility in response to technological changes in its environment where nimbleness prevails over slow move. Second, the attitude toward risk which encourages risk taking/exploration instead of caution. Third, the organization's decision-making which is data-driven rather based on intuition. Fourth, the leadership style which is distributed rather than hierarchical. Fifth, the workers' take on work-life relationship where people live to work instead of working to live. Finally, the work style in which people act collaboratively rather than in silos.

Regarding digital maturity in the healthcare industry, organizations can increase their efficiency by combining technologies (Abood et al, 2017; Tripathi et al., 2020). The combination of technologies like the Internet of things (IoT), artificial intelligence (AI), machine learning (ML), robotics, cloud computing, wide area networks (WAN) and big data analytics (BDA) has advanced e-health with the emergence of the concept of smart healthcare systems (SHSs) (Tripathi et al., 2020) as a result. SHSs are health systems in which all entities - living and nonliving - are interconnected to facilitate capturing, storing, communicating, and sharing of information (Tripathi et al., 2020).

To conclude, in the healthcare industry, smart health systems represent the highest level of digital maturity.

2.2.4. Approaches to digital transformation initiation

Berghaus and Back (2017) identify five approaches to DT initiation - centralized approach, bottom-up approach, IT-centered approach, innovation-centered approach, and channel-centered approach.

The *Centralized approach* is a holistic approach to digital transformation in which organizations define first their digital strategy or incorporate DT in their corporate strategy. Those opting for this approach first analyze their current situation then create a roadmap to bridge any gaps revealed by this analysis (Berghaus & Back, 2017). As to the *bottom-up approach*, it is an approach to digital transformation in which ideas originate in different business units first, then get communicated to the top management which finally conceives and leads a holistic DT program (Berghaus & Back, 2017). Regarding the *IT-centered approach,* it is an approach in which digital transformation projects are basically seen as technology-focused projects with technology taking precedence over any strategic and cultural considerations. Those who opt for it focus on building appropriate digital infrastructure with a long-term vision for digital readiness purposes (Berghaus & Back, 2017).

Concerning the *innovation-centered approach,* it is followed by ambitious organizations vying for a leadership position in the digital world. This approach is appropriate in organizations with an entrepreneurship mindset in an environment conducive to creativity (Berghaus & Back, 2017). Finally, the *channel-centered approach* is a strategy followed by those still at the embryonic stage of DT. Such organizations totally or mainly operate in

a brick-and-mortar business model and want to improve customer experience by building or improving their digital channels (Berghaus & Back, 2017).

In summary, organizations can choose from a variety of approaches to digital transformation, the suitability of each depending on several factors among others, the organization's digital readiness, risk appetite and ambitions (Berghaus & Back, 2017; Ringberg et al., 2019).

2.3. CONCEPTS RELEVANT TO THE MANAGEMENT OF PROJECT FRONT-END

What is the project front-end and what are its main characteristics? The project front-end is the first phase of a project meant to generate ideas first, then refine them prior to the selection of the best one for development during the project implementation phase (Kim & Wilemon, 2002; Alam, 2006; Berghaus, 2016). Regardless of the type of project, the project front-end activities constitute a highly uncertain process (Kim & Wilemon, 2002, Samset & Volden, 2016) and as such requiring a qualitative, informal and approximative approach centered on learning, creativity, experimenting and information flow rather than a quantitative, formal, and precise approach (Kim & Wilemon, 2002; Stevens & Burley, 2004; Berghaus, 2016). In short, the management of the project front-end is more of an art than a science (Bohn, 1994, p. 67) done in three main stages – concept identification, concept elaboration and concept assessment (Murphy & Kumar, 1997; Samset, 2010).

As indicated in section 2.1, the search for knowledge likely relevant to the management of the project front-end in healthcare digital transformation was guided by the literature on the nine schools of thought in project management (Turner et al., 2013). For organizing

purposes, this knowledge was grouped in ten (10) concepts, a number of items that can be retained if seen as meaningful (LeCompte, 1999, p. 290). These are:

i) *Concept evaluation and path dependency (related to concept selection in project design dimension of HWF)*

ii) *Power and interests of project stakeholders in concept selection (related to concept selection in project design dimension of HWF)*

iii) *Project concept elements and importance of alternative concepts (related to project strategy in project design dimension of HWF)*

iv) *Innovation – heeding the voice of customer (VOC) or taking a leap of faith (related to value added in project goal dimension of HWF)*

v) *Project as a technical, social, and cognitive concept (related to both hard and soft skills in project design and context dimensions of HWF)*

vi) *Project front-end and uncertainty (related to novelty in project design dimension of HWF)*

vii) *Project front-end stages (related to project structure in project design dimension of HWF)*

viii) *Project management, project governance and project outcomes (related to project management methodology in project design dimension of HWF)*

ix) *Project benefits across time and space (related to project environment in project context dimension of HWF)*

x) Project as an input-output process in a specific context (related to project permeability in project context dimension of HWF)

2.3.1. Concept evaluation and path dependency

Regarding concept evaluation in the project front-end, Samset and Volden (2016) observe many instances where selected alternatives reflect the continuation of the current solution or just variations over a theme - a phenomenon called path dependency. Path dependency is a phenomenon where history matters - what has occurred in the past persists because of resistance to change and this is observed when organizations adopt and maintain initial concepts or standards even when there is a better alternative (Kranz et al., 2016, p. 487; Banton, 2019). People resist change due to different reasons including uncertainties about the unknown, novelty, routine distraction, culture change, loss of status or control, power, and security (Lundy & Morin, 2013).

2.3.2. Power and interests of project stakeholders in concept selection

To select a project concept, organizations base their choice on several factors, mainly expert advice, and decision-makers' preferences but whenever there is a disagreement, it is generally the latter that prevails (Samset & Volden, 2016). Project stakeholders do not have the same interests in a project, and this can influence the selection of a project concept (Samset, 2010). The implementing party or contractor is generally concerned with tactical success i.e., project outputs or efficiency - the production of project deliverables on schedule, within budget and to specifications. As for the project user i.e., project client, they are interested in the project goal or the satisfaction of their needs by project outputs

(concern for effectiveness). Finally, the financing party or project owner's focus is on project purpose or the project's ability to deliver organizational and societal benefits in the long run (Samset, 2010).

According to Murphy and Kumar (1997), the selection of a product concept at the front-end of a NPD project is a formal process in which technical experts evaluate the concept in terms of its market, technical, operational, financial, managerial, and strategic drivers but, it is generally the management's intuition that prevails at the end. According to Samset and Volden (2016) managers often ignore expert advice but, to these authors, this is not surprising because technical experts and decision-makers do not subscribe to the same paradigms - mindsets and work methodologies. As above-mentioned, technical experts mainly use quantitative methods relying on techniques such as complex models for simulation and cost-benefit analysis while decision-makers favor qualitative approaches which consider non-monetized impacts (Samset & Volden, 2016, p. 306-7). The authors consider quantitative analyses as unreliable means for predicting project outcomes in the long run i.e., societal benefits which are the main concern for decision-makers. Kim and Wilemon (2002) concur with them and observe that formal market analyses are often misleading in the context of radical innovations.

Furthermore, decision-makers believe that technical experts are mainly driven by self-interest, and this increases their distrust of them. This distrust is a real phenomenon, and the following accounts are sufficiently revealing. First, the tendency of technical experts to deliberately underestimate projects' costs to make them look more attractive and

consequently increase their chances for selection - a stratagem known as "strategic cost underestimation" (Samset, 2010, p. 79). In the context of DT projects, Bourdeau et al. (2021, p. 159) observe the tendency for people with vested interests in particular projects to overestimate their benefits to ensure their selection and financing and this corroborates the reality of stratagems in project conceptual phase. Second, technical experts are not learners, and lessons from past projects are widely ignored: *''The tendency is to look ahead with the concern of how to spend next year's budget, rather than look in the rear mirror to learn from experience''* (Samset & Volden, 2016, p. 306, 311). Based on ex-post project evaluations, successful projects are generally those in which there has been an agreement between managers and technical experts, but this agreement is rather an exception due to the above-mentioned divergent interests and distrust between these two (2) parties (Samset & Volden, 2016).

The impact of concept selection on project outcomes is widely recognized and this is reflected in some countries' policies that show the importance of the project front-end and measures that must be taken to ensure the selection of the best conceptual solutions especially in large projects. Regarding the importance of the project front-end, its activities should take between 15% and 35% of project resources, but in reality, fewer resources are allocated to this phase compared to the project implementation phase (Samset & Volden, 2016, pp. 301-2). As to quality assurance for concept selection, two (2) measures are proposed. First, there must be at least two (2) conceptual solutions in addition to the zero option also known as the reference concept or alternative 0, from which to choose the best

concept (Samset, 2010, p. 157). The zero option corresponds to the adjustment of the existing solution to newly expressed needs, with little investment (Samset, 2010). Second, there must be external consultants to assess the merit of the decision process that has led to the selection of the best concept by the focal organization (Samset, 2010, p. 157).

In essence, technical experts focus on short-term benefits and decision-makers on societal long-term benefits and these mindsets influence their selection while evaluating project concepts. The bigger the number of conceptual solutions, the greater the chance to select a better concept when this selection proceeds from an unbiased decision-making process.

2.3.3. Project concept elements and the importance of alternative concepts

Project concept selection is an activity meant to generate the input to project implementation (Murphy & Kumar, 1997, Samset & Volden, 2016) and its success requires the consideration of the following five factors: project inputs, project outputs, the project goal, project purpose and project uncertainty (Samset, 2010). Project inputs are funding, staff, and all kinds of material resources necessary for creating project outputs. Project outputs are the results of project implementation. Project goal refers to the satisfaction of the client's needs and project purpose to societal benefits or project long-term benefits (Samset, 2010). Regarding project uncertainty, it is the gap between what is required and what is available as information in the decision-making process (Atkinson et al., 2006; Frishammar et al., 2010).

According to Samset (2010, p. 8), early project concept is a solution to a specific problem that is expressed in sufficiently generic terms to allow the consideration of alterative

technical solutions. Generally, the initial concept comes from the mind of one individual, based on their experience and intuition and is often retained due to the lack of a further search for alternative solutions. In this regard, it is better to elicit alternative ideas and let them compete until the best concept emerges and this is important given the cost of killing an idea once it has made it into the implementation phase (Cooper & Kleinschmidt, 1988, p. 262; Kim & Wilemon, 2002, p. 271; Samset & Volden, 2016).

2.3.4. Innovation - heeding the voice of the customer or taking a leap of faith

Project front-end activities are a creative process meant to lay the foundation for organizational innovation (Stevens & Burley, 2004; Alam, 2006; Berghaus & Back, 2017). Project front-end management is an informal process, and its effectiveness mainly depends on people's creativity, imagination, and intuition (Kim & Wilemon, 2002; Stevens & Burley, 2004; Samset & Volden, 2016). Organizational creativity and innovation are two (2) indissociable notions, the former being defined as the production of novel and useful ideas and the latter, as the successful implementation of creative ideas within an organization (Amabile et al., 1996). Kock et al. (2014) recognize the role of creativity in project front-end stages and propose a strategy to manage it. They suggest the combination of two (2) strategies - open action strategy and closed action strategy, the former consisting of encouraging idea generation and the latter in formalizing the process to ensure the alignment between generated ideas and the organization's strategy.

As mentioned above, the project front-end is an uncertain process and this uncertainty is reflected in the challenges encountered in this phase and its outcome. In relation to this

uncertainty, only one (1) out of 300 project ideas generated in the context of new product development (NPD) results in commercial success, the reason for this poor outcome being the lack of novelty in created products (Stevens & Burley, 2004, pp. 17-8). To succeed, NPD projects require creative managers with the ability to reshape ideas generated in the project front-end: *"The first few plays of the game determine the outcome"* (Stevens & Burley, 2004, p. 18). In addition to having creative managers, to successfully innovate, organizations need to better understand the needs of their customers by seeking their input to project conception (Murphy & Kumar, 1997; Samset & Volden, 2016), a practice with disputable effectiveness. Those valuing customer input associate innovation with the satisfaction of customer needs – both current and future needs - (Kim & Wilemon, 2002, p. 275) and seek customers' input through tools and techniques such as Web 2.0 applications i.e., Internet-based technologies gathering collective intelligence through social networking and crowdsourcing (Huang & Benyoucef, 2013).

As for those skeptical about the ability of customers to contribute to innovation conception in any way, they do not seek their input because, to them, they do not know what they want exactly. So, overlooking their contribution is inconsequential. In this school of thought, Steve Jobs stands out for his preference for a ''one person focus group – himself - over traditional focus groups and his belief about the potential of customer input to innovation reveals itself in the following statement ' *Customers don't know what they want until we've shown them''* (Isaacson, 2012, p. 97).

Digital transformation can be visualized as a continuum of states along the line of the potential of customer input. On one hand, there is incremental innovation or a degree of innovation generally seeking and relying on customer input (von Leipzig et al., 2017). On the other hand, there is radical innovation or a degree of innovation typically overlooking customer input (von Leipzig et al., 2017). Innovation entails the experimentation with new ideas with financial risks commensurate to the degree of innovation targeted and only those with deep pockets can afford to undertake radical innovation without endangering the survival of their organizations. According to Ringberg et al. (2019, p. 105), approximately 85% of radical innovation in product area fail and this illustrates the financial risk associated with innovative projects. Conclusion? Two (2) points. First, the management of the project front-end is more of an art than a science and should be treated as such. Second, whether to take "*Jobs' leap of faith*" i.e., to undertake radical innovation without seeking input from the intended customers or heed the voice of the customer (VOC) i.e., to innovate in an incremental fashion, it depends on one's ambitions, and means, of course.

2.3.5. Project as a technical, political, and cognitive concept

A project can be viewed in different ways - including the conception as a technical, social, and cognitive concept (Turner et al., 2013; Aubé et al., 2014) - and this has implications on the management of project front-end activities. The conception of projects as technical concepts corresponds to the traditional approach to project management rooted in scientific management (Déry, 2007; Morgan, 1998) with projects seen as instrumental processes to be optimized by technical experts (Turner et al., 2013). In relation to this conception,

sometimes people recommend "bad" project concepts, and this can happen for instance with inappropriate technical analyses such as cost-benefit analyses for predicting project long-term benefits in uncertain environments (Samset & Volden, 2016, p. 307).

As to the conception of projects as political concepts, it originated from a research initiative called *Rethinking Project Management Network* (Winter et al., 2006) viewing projects as social processes in which power and politics take the center stage. In this conception, projects are seen as undertakings shaped by powerful stakeholders in pursuit of their interests and technical analyses largely ignored (Murphy & Kumar, 1997; Samset & Volden, 2016). In the same vein, some people, driven by perverse incentives, pursue self-interests and advocate projects even if they are not likely to add value to business (Morris, 2013, p. 165; Samset & Volden, 2016, p. 308). Regarding perverse incentives, Janssen et al. (2015, p. 22), relate an instance of a DT project in which project leaders have tricked project recipients into choosing a wrong project concept after it had been deceptively framed as the best conceptual solution. Sociopolitical issues constitute a major source of project complexity often associated with people's hidden agendas (Remington & Pollack, 2016; Maylor et al., 2008) and one way to deal with them effectively is to delay the transition between project conception and project implementation with hope to see people's motives revealed over time (Remington & Pollack, 2016). In addition, organizations can effectively manage the project front-end of their DT by treating it as a complex adaptive system – a process characterized by non-linearity, dynamic behavior,

emergence, and self-organization (Mowles, 2010, Hanisch & Wald, 2011; Janssen et al., 2015).

Finally, regarding the cognitive aspect of project front-end management, Samset and Volden (2016, p. 306) mention several reasons for project cost underestimation including over-optimism which is a common cognitive bias in project contexts. The literature on decision-making attributes bad decisions to a variety of factors including cognitive factors such as affect heuristic, overconfidence, anchoring, optimism, competition neglect, confirmation, commitment, sunk-cost, status quo, and self-interest biases and proposes different strategies to prevent them (Finkelstein, 2003, Kahneman et al., 2011; Sibony, 2014; Sibony et al., 2017). Cognitive biases negatively impact corporate performance, but organizations can successfully reduce them through strategies such as "reference class forecasting" (Flyvbjerg, 2006), and the behaviorally informed decision architecture of a firm (BIDAF) (Sibony et al., 2017) when making strategic decisions.

Contrary to the traditional approach to forecasting that takes an inside view on a project, reference class forecasting improves project outcomes through an outside view on a project - i.e., estimating the outcome of a project based on knowledge about actual performance of similar projects (Flyvbjerg, 2006). As to the BIDAF, it consists of seven principles meant to improve the decision-making process - formality, information, layering, participation, incentives, debate, and closure (Sibony et al., 2017).

Biases are behaviorally and neurally hardwired to such an extent that decision-makers cannot (or will not) abandon them in response to research findings or advice from

consultants. Conscious or unconsciously, people do not want to lose their cognitive biases but derive psychological comfort or practical value from them. Interventions designed to remove individual decision biases are less effective than those designed to modify the environments in which decisions are made (Sibony et al., 2017, p. 4). Sibony et al. (2017) distinguish three types of strategic decision processes. First, the investment process and the degree of risk tolerance - risk aversion or risk taking. Second, resource allocation process and the degree of agility in response to environmental signals - status quo or change in resource allocation. Third, the innovation process and the desired outcome - incremental or radical innovation. In relation to these processes, the same authors mention several factors that can lead to bad decisions. People have limited conscious power over their own biases, yet decision environments are filled with cognitive biases, emotions, ideologies, social processes, and political conflicts and this shows the importance for organizations to design strategic decision processes to deal with individual and small-group biases before they become institutionalized as organizational decisions (Sibony et al., 2017).

In sum, projects are technical, social, and cognitive constructs and should be conceived and treated as such in project front-end activities.

2.3.6. Project front-end, and uncertainty

Uncertainty refers to a situation in which the outcome of a particular event or activity is likely to deviate from the estimate or forecast value (Samset & Volden, 2016). According to Atkinson et al. (2006), uncertainty is the gap between the data required and those already possessed for a certain purpose or the lack of information and distinguish three types of

uncertainty - uncertainty related to estimating, uncertainty related to project parties and that related to stages of a project life cycle. The estimation of potential variability in relation to performance measures like cost, duration, or deliverables' quality is an example of activities that can be adversely affected by uncertainty (Atkinson et al., 2006).

In relation to project life cycle, uncertainty is at its highest level in project front-end stages and decreases as the project progresses into subsequent phases (Alam, 2006; Samset & Volden, 2016). Quantitative and qualitative information can help reduce uncertainty, but the former tends to devalue over time, especially in dynamic environments and for better results, Samset and Volden (2016) recommend the combination of these two (2) types of information. According to Samset and Volden (2016), creativity, imagination, and intuition can be more valuable than large amounts of information and organizations can leverage them to prevent the problem of information overload. Finally, as another means to reduce project uncertainty, Kim and Wilemon (2002) suggest the building of an information system (IS) that facilitates information sharing and knowledge transfer among project stakeholders.

2.3.7. Project front-end stages

Schematically, the project front-end comprises three main activities: first, the generation of a project idea (ideally with alternatives), then the translation of a project idea into a project concept followed by concept elaboration meant to generate information about project feasibility. Finally, project front-end activities conclude with the selection of a

concept destined for development during the project implementation phase once approved by the competent authority (Murphy & Kumar, 1997; Samset, 2010).

2.3.8. Project management, project governance and project outcomes

According to Samset and Volden (2016), it is important for organizations to distinguish project governance and project management in the project front-end. Project governance is a framework within which project decisions are made (Garland, 2009) and seen, if properly designed and implemented, as a key factor for project success, both tactical (concern for efficiency) and strategic (concern for effectiveness) (Samset & Volden, 2016). As for project management, it is the use of tools and techniques to efficiently create deliverables (Kerzner, 2013; Samset & Volden, 2016). This conception of project management is associated with optimization school in project management – an approach to project management paradigm concerned with efficiency in project delivery (Turner et al., 2013). In short, project governance is concerned with *''doing the right things''* while project management focuses on *''doing things right''* (Macheridis, 2011).

Projects are meant to bring out beneficial changes and as such require appropriate leadership, that is, a direction adapted to change context (Lundy & Morin, 2013). Leadership features among topics that have been extensively researched with styles differently designated. Goleman (2000) distinguishes six (6) styles of leadership with coaching and coercive leadership located at the opposite ends of a continuum representing the degree of process control. As to Whittington et al. (2020), they describe three types of leadership in decreasing order of process control, that is, transaction, situational and

transformational leadership. Transactional leadership consists in designing and monitoring change first, then controlling progress toward predetermined goals, and is appropriate to delivering results in a relatively stable context (Whittington et al., 2020). As to transformational leadership, it is characterized by three things. First, charisma i.e., the ability of a leader to portray a vision of the desired future in a compelling way, second, intellectual stimulation i.e., consulting with others to seek and consider their input to problem solving and finally, individualized consideration i.e., empowering others, that is, developing their capabilities (Howell et al., 2005; Whittington et al., 2020). Finally, for a leader, situational leadership consists in combining elements of transactional and transformational leadership then adapting their leadership style to the context of change (Whittington et al., 2020).

Regarding project outcomes, projects are sociopolitical constructs (Winter et al., 2006; Remington & Pollack, 2016) and this explains why project stakeholders often disagree on project outcomes, everyone evaluating the project based on what matters most to them, either project tactical success or project strategic success (Samset & Volden, 2016). Regarding the concern for strategic success, a project can be seen as a failure by the intended project users despite being a success from a tactical perspective (focus on cost, schedule, and scope) and this has happened in various instances such as the one in which a project concept was already considered obsolete by the project client at project completion (Samset & Volden, 2016, p. 300). On the other hand, a project considered as a failure due to cost and schedule overruns that had resulted from unexpected technological

changes (project tactical failure) can turn out to be a success years later after its commissioning (project strategic success) (Samset & Volden, 2016, p. 2016, 300). This phenomenon has been observed in different projects including the Sydney Opera House that was first considered as a failure from a tactical perspective (cost and schedule overruns) then deemed a huge success later from a strategic viewpoint (a world-class tourist attraction) (Ika, 2009; Chang et al., 2013). In the same line of thought, Bourdeau et al. (2021) distinguish two (2) distinct but complementary practices, that is, the project management concerned with project delivery (project tactical outcome) and the management of project benefits concerned with the delivery of project benefits beyond project closure (project strategic outcome).

In brief, any judgment about project outcomes is a matter of viewpoints and for this reason, it is advisable for organizations to adopt a multi-stakeholder approach to project evaluation (Davis, 2018).

2.3.9. Project benefits across time and space

It is important for project stakeholders to ensure project viability or project long-term benefits (project strategic success) and for this reason, they need to avoid myopic decisions (Samset & Volden, 2016). This calls for creative thinking on the part of project stakeholders to imagine all possible future scenarios first, then select the project concept based on that (Samset & Volden, 2016). It is important for project sponsors to generate insights regarding the project's viability ex-ante and Samset and Volden (2016) propose the combination of qualitative and quantitative methods for this purpose. Projects in

dynamic fields such as information systems need to be conceived with consideration of a long-time horizon. In this regard, Brown et al. (2007) indicates some characteristics of a good information system and flexibility of technology infrastructure that allows the integration of new technologies is one of them. In the same vein, Garg, and Agarwal (2014) cite ease of upgradation among characteristics of a good enterprise resource planning (ERP) system. Finally, Stephanie and Sharma (2020) consider technology scalability as a success factor for DT. Moreover, Grossman (2009) makes the case for cloud computing to ensure scalability, and this at a fraction of the cost compared to on-promises computing model. According to Bourdeau et al. (2021), digital transformation benefits often take time to materialize, and this is another reason for considering technology scalability.

Luftman and Kempaiah (2007) describe a five-level digital maturity model with the highest level characterized among others by the co-evolution of technologies across a business supply chain in terms of technology governance, scope, and interoperability. This concern for communication with business partners is also reflected in concepts such project management information systems (PMIS) within the extended enterprise (Braglia & Frosolini, 2014) and digital platform ecosystems (Hermes et al., 2020).

In conclusion, a good DT concept is one with the potential to address issues related to project temporal dimension or project value in the long run (project benefits in time) and those related to project spatial dimension or the ability of an organization to exchange information with business partners in its environment (project benefits in space).

2.3.10. Project as an input-output process in a specific context

In its holistic conception, a project is an input-output processes in a specific context and as a managerial implication, it is important for organizations to treat every project as a unique case and manage it as such (Smyth & Morris, 2007; Blomquist et al., 2010). So, what can be taken away from the above 10 concepts? In brief, the management of the project front-end consists of three tasks, namely, managing creativity, facilitating the generation of alternative project concepts, and ensuring an unbiased decision-making process when selecting project concepts.

With respect to the importance of creativity management in PFE activities, digital transformation is an innovative process (von Leipzig et al., 2017) and this calls for an effective management of creativity in the project front-end based on a variety of frameworks such as Woodman et al.'s (1993) interactionist model of organizational creativity. As for the relevance of the generation of alternative project concepts, it seems self-explanatory given the association of the number of competing concepts with the quality of selected concepts (Samset, 2010) and organizations can achieve this by different techniques including systems analysis (Samset, 2010; Kerzner, 2013). Finally, regarding the importance of an unbiased decision-making process in PFE, cognitive biases, and perverse incentives feature among key factors for project failure traceable to project front-end management (Samset & Volden, 2016) and this shows the importance of mechanisms such as Sibony et al.'s (2017) behaviorally informed decision architecture of a firm meant to prevent them.

2.4. SOMMAIRE DU CHAPITRE 2 – *LITERATURE REVIEW*

Indépendamment du type de projet et du secteur d'activité, la gestion de la phase conceptuelle de projet a, jusqu'à présent, été moins étudiée que la phase de mise en œuvre de projet malgré la reconnaissance du rôle joué par cette phase dans la détermination des résultats d'un projet. Concernant la conception des projets de transformation numérique entrepris dans le secteur de soins de santé, la revue des publications de deux dernières décennies révèle le même phénomène. Concrètement, ces publications portent sur une variété de sujets tels que l'ampleur du recours à ce type de projets, la phase de mise en œuvre de ces projets et les problèmes rencontrés dans cette phase, mais ne nous renseignent pas sur phase conceptuelle de ces projets.

Comparativement aux autres phases de projet, la phase conceptuelle évolue dans un contexte de plus grande incertitude où les considérations politiques priment sur l'expertise technique et pour cette raison la gestion efficace de cette phase relève de l'art plutôt que de la science[9]. Basée sur les caractéristiques générales de la phase conceptuelle de projet, cette étude a mobilisé certaines théories qui étaient jugées pertinentes à la compréhension de conception des projets qui étaient l'objet de cette recherche. Il s'agit des théories discutées principalement par cinq écoles de pensée en gestion de projet[10]. Ces écoles sont l'école de décision, l'école de gouvernance, l'école de marketing, l'école de modélisation et l'école de processus.

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[9] Bohn (1994, p. 67)
[10] Turner et al. (2013)

NEXT CHAPTER - RESEARCH CONCEPTUAL FRAMEWORK

- HANISCH AND WALD'S PROJECT MANAGEMENT RESEARCH FRAMEWORK

- SAMSET'S PROJECT FRONT-END MANAGEMENT MODEL

- SOMMAIRE DU CHAPITRE

CHAPTER 3 - RESEARCH CONCEPTUAL FRAMEWORK

In this section, I present the conceptual framework – a system of concepts, assumptions, expectations, beliefs, and theories (Maxwell, 2013) - that has informed my research, i.e., guided the formulation of my research problem and related matters. I conceived a project conception as a series of activities realized by a variety of project stakeholders to achieve a particular goal. Concretely, this process consists of the generation of a project idea first, then, the translation of the project idea into several project concepts, the elaboration of project concepts, the selection of the best project concept, then the approval of a project concept followed by its funding for project implementation. The conceptual framework that was created for this study (Figure 3.1) derived from two (2) theoretical frameworks - Hanisch and Wald's (2011) project management research framework (Figure 3.2) and Samset's (2010) model for project front-end management (Figure 3.3).

Hanisch and Wald's (2011) project management research framework views any project-related activity in a holistic way – considering its design, goal, and context -, and for this reason, it constitutes a suitable lens for looking at a process from different perspectives. As to Samset's (2010) model for project front-end management, it is a generic framework for managing project conception and its relevance to my research resides in its elaboration. So, both theoretical frameworks were deemed complementary and relevant to my research.
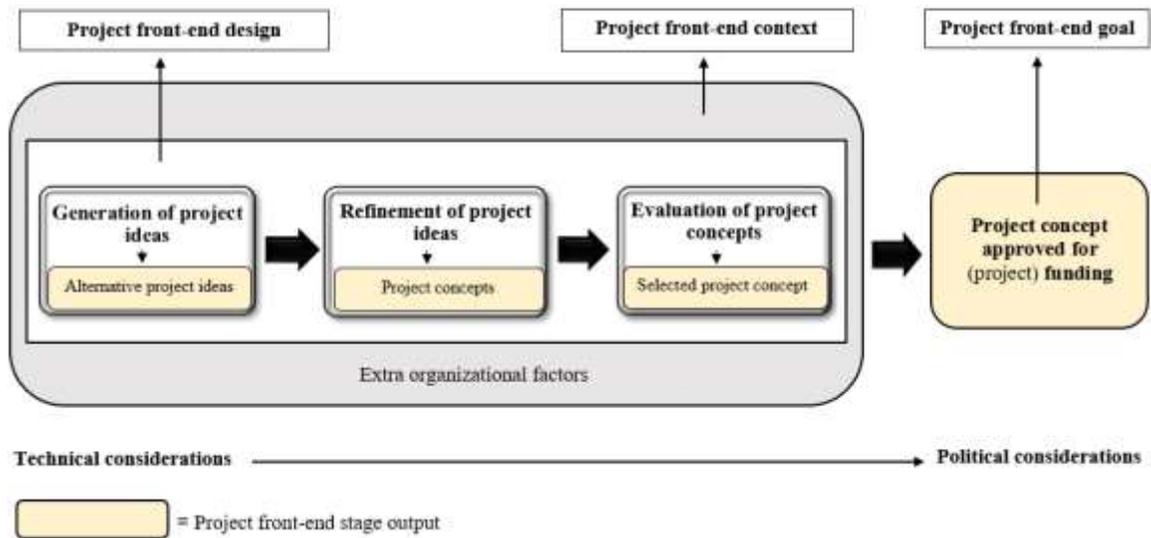
Figure 3.1. Conceptual framework for project front-end management (Author)

3.1. HANISCH AND WALD'S PROJECT MANAGEMENT RESEARCH FRAMEWORK

Hanisch and Wald (2011) conceive a project as an input-output process unfolding in a specific context and propose a project management research framework made of three dimensions - the project design dimension (D), the project goal dimension (G), and the project context dimension (C) with eight subdimensions.

So, this section discusses this framework and proceeds as follows: i) the project design dimension ii) the project goal dimension, and iii) the project context dimension.

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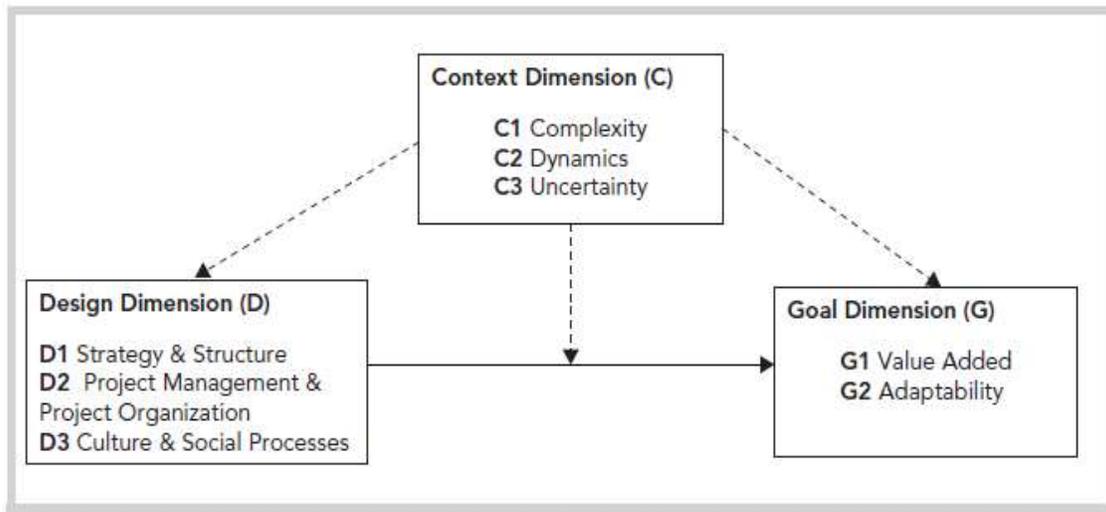
Figure 3.2. Hanisch and Wald's (2011) project management research framework

3.1.1. Project design dimension

The design dimension (D) refers to the initial setup of tangible and intangible resources meant to help an organization achieve its goal and comprises three subdimensions - the strategy and structure subdimension (D1), the project management and project organization subdimension (D2), and the culture and social processes subdimension (D3). D1 is concerned with the link between the project and the permanent organization (project parent organization) or the characteristics of the permanent environment in which the project is embedded. This subdimension addresses aspects such as the alignment of project management with business strategy and corporate mechanisms meant to support projects such as the availability of models for project selection, according to the organization's strategy and the role of the project management office (PMO). As for D2, it encompasses all project aspects related to methodologies, tools, standards, and procedures. Finally, D3

is related to relationships between projects and people and covers concepts such as communication, change management and social networks.

3.1.2. Project goal dimension

The goal dimension (G) refers to the desired result of a project and comprises two (2) subdimensions - value added (G1) and adaptability (G2). G1 portrays projects as business processes and is associated with notions such as project success and failure, renunciation of the iron triangle (the mechanistic approach to project management), and product innovation. As for G2, it relates to the ability of an organization to transform and innovate to ensure competitiveness.

3.1.3. Project context dimension

The context dimension (C) is a category consisting of factors external to the project but with the potential to moderate the effect of the design dimension on the goal dimension. This dimension also has three subdimensions – the complexity subdimension (C1), the dynamics subdimension (C2) and the uncertainty subdimension (C3). C1 comprises concepts such as projects as complex adaptive systems (CAS), projects as complex social systems and system dynamics. Regarding C2, it is concerned with a project and changes to project over time, and encompasses issues such as urgency, project life cycle, and process dynamics. As for C3, it shows the link between projects and the unknown and it contains concepts such as decision-making and risk management. Project context can also be characterized by conducting two (2) types of analysis, namely, PESTEL analysis and complexity analysis. PESTEL analysis is an analytical device that provides information on

macro-environmental factors in different domains with the potential impact on project outcomes. This analysis concerns political, economic, social, technological, environmental, and legal factors. As for project complexity analysis, it refers to the inquiry into different dimensions of project complexity. Remington and Pollack's (2016) project complexity typology can serve as an organizing device for different notions discussed by Hanisch and Wald (2011) in the context dimension of their framework. Remington and Pollack (2016) distinguish four types of project complexity. First, structural complexity which is related to the number of interdependent parties in a project. Second technical complexity which is related to the difficulty of turning a project concept into a product. Third, directional complexity is associated with divergent views among project stakeholders on project objectives and covers various phenomena such as those related to hidden agendas, power, politics, social and cultural issues. Finally, temporal complexity which associates project risk with the length of a project life cycle.

3.2. SAMSET'S MODEL FOR PROJECT FRONT-END MANAGEMENT

Samset (2010) proposes a model for the management of the project front-end or project conceptual phase in three stages - project concept identification, project concept elaboration/development and project concept assessment/appraisal (Figure 3.3).
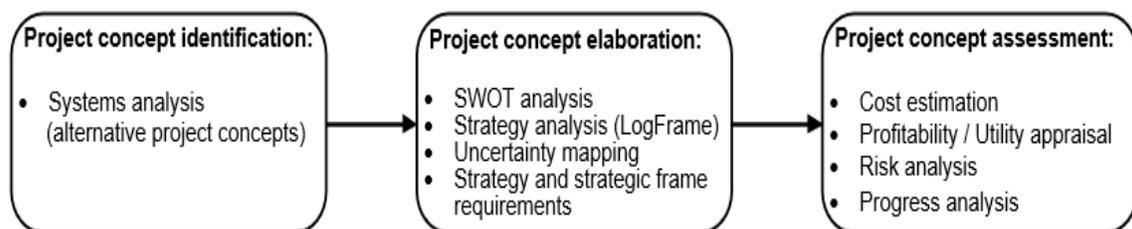
Figure 3.3. Samset's (2010) model for project front-end management

In the following lines, I elaborate on these three stages, tools, and techniques used to manage project front-end activities.

3.2.1. Identification of project concepts

With alternative project concepts, concepts compete, and this leads to the emergence of the best concept. To identify different concepts, organizations use different techniques including systems analysis - an open approach by which the identification of potential solutions to a particular problem is done without favoring any concept.

A system is a combination of people, processes, technologies, and material components relied upon to achieve an objective (Samset, 2010, p. 171). Schematically, systems analysis comprises two (2) main stages. First, the analysis clarifies the needs and functional requirements of the conceptual solution by considering the environment in which the solution must be applied. Second, the analysis ends with the generation of alternative concepts and the emergence of the best concept from the competition between different concepts. Concurring with Samset (2010) on the suitability of systems analysis in concept identification, Kerzner (2013) associates system thinking with effective problem-solving due to its ability to prevent decision-makers' biases.

3.2.2. Elaboration of project concepts

Once one or more promising concepts have been identified, they must be developed in anticipation of concept selection. Concept elaboration or development consists in showing what the project will produce and achieve, resource availability, and possibilities and limitations associated with project implementation. This process uses the following

techniques: SWOT analysis (focus on strengths, weaknesses, opportunities, and threats), strategy analysis, uncertainty mapping and strategy and strategic frame requirements.

SWOT analysis consists in identifying factors that can facilitate or hinder project implementation. Some factors are associated with the organization and called internal (strengths and weaknesses) and other external to it (opportunities and threats). An organization's strengths or weaknesses are mainly associated with technical, economic, and institutional factors while an organization's opportunities and threats are mainly ascribed to environmental, social, and political factors.

Project strategy analysis or *project logical framework* consists in determining project feasibility based on five dimensions of a project concept - project inputs, project outputs, project goal, project purpose and project uncertainty. This analysis helps in estimating the chance of a project concept to achieve different levels of objectives given the degree of uncertainty in which the project is set to be implemented. Strategy analysis uses logical framework, a device that presents project inputs, project outputs, project goal and project purpose in the form of a cause-effect chain embedded in the associated project uncertainty. Samset's (2010) strategy analysis corresponds to project feasibility or organizational fit of project concept – a notion referring to the existence of human and technical expertise in the focal organization and to the alignment between a project concept and organization's business strategy (Murphy & Kumar, 1997; O'Shaughnessy, 2006; Kerzner, 2013).

Uncertainty mapping: Uncertainty mapping is a technique that complements SWOT analysis for concept development in a specific environment and provides additional

information on the merit of a project concept based on opportunity or risk associated with it. Uncertainty mapping reveals four types of uncertainty factors or events likely to occur in a project environment with the potential to affect a project either positively or negatively. These factors are associated with opportunity, low risk, real risk, and fatal risk for a project strategy and below is the description of two (2) extremes or scenarios that deserve special attention. Project opportunity exists when an uncertainty factor is strongly associated with a positive impact on a project and with a high probability of manifestation. The project strategy associated with such a factor should remain unchanged. At the opposite extreme, a project is likely to incur fatal risk when the project strategy is associated with an uncertainty factor that has an important negative impact regardless of the probability of its occurrence. In this case, the project strategy must be modified to reduce the level of the risk and when this is not possible, the project concept must be abandoned.

Strategy and strategic frame requirements: The project implementing party needs some tactical flexibility - a certain leeway to handle uncertainty when producing project outputs. But this flexibility must be exercised within the boundary of strategic frame, or requirements set by the project owner. Given project uncertainty and terms of strategic guidance, it is possible to have an idea about project feasibility and all these factors need to be considered while determining the viability of a project associated with a particular project concept.

3.2.3. Assessment of project concepts

Once a project concept has been elaborated, the next step is to evaluate the proposed concept based on criteria such as cost, profitability/utility, duration, and risk.

Available information must be supplemented by different sources of information such as empirical data, subjective assessments, and expert assessments in addition to stochastic analysis. Concept appraisal uses different techniques such as cost analysis, profitability appraisal, risk analysis and progress analysis. In addition to the use of these techniques, this process needs to be supported by appropriate decision-making principles such as those found in the behaviorally informed decision architecture of a firm, a strategy that deserves consideration given the prevalence of bias in strategic decisions whether in project or operational context.

Cost analysis: This analysis preferably uses top-down approaches based on expert assessment. First, a rough estimate is determined, then the cost is refined after the assessment of uncertainties associated with individual parts of the initial estimate.

Profitability appraisal: The profitability of a project is determined by cash flow analyses and is indicated by terms such as net present value (NPV) or internal rate of return (IRR).

Risk analysis: This analysis is important to determine the viability of a project concept. To this end, the risk matrix is used to determine the risk level of a project based on the consequences of an event and the probability of its manifestation.

Progress analysis: The duration of a project can be estimated with stochastic analysis that allows estimating the duration of the individual project components. The network structure

of activities shows the duration of critical activities and bottlenecks, and this information is crucial to the calculation of project's duration. As a complement to Samset's (2010) approach to concept assessment, once the feasibility of various concepts has been determined, the next and last step in concept assessment consists in conducting a benefit-to-cost analysis – the determination of tangible/monetary and intangible/non-monetary benefits expected from the project (Kerzner, 2013; Samset & Volden, 2016). Finally, to prioritize project concepts, an organization can use a scoring model – a method that allows concept rating based on several appraisal criteria with same or different weights (Archer & Ghasemzadeh, 1999; Kerzner, 2013). Also, worth mentioning is the importance of non-expert judgment in concept selection whereby managers' "gut feel," i.e., political considerations often prevail over technical analyses (Murphy & Kumar, 1997, p. 13; Samset & Volden, 2016, p. 302; Williams et al., 2010).

Behaviorally informed decision architecture of a firm: As earlier mentioned, a wrong project concept can be selected for different reasons and cognitive factors feature among those deserving a special attention to prevent this issue (Finkelstein, 2003, Kahneman et al., 2011; Sibony et al., 2017). Therefore, it is important for organizations to have effective mechanisms for an unbiased decision-making process and to this end, they can design and use the behaviorally informed decision architecture of a firm. What is a BIDAF? This is a tool that can help an organization make the right decisions, especially in the context of big decisions, i.e., those of strategic importance (Sibony et al., 2017). As its building blocks, this architecture has the following seven elements: formality, layering, information,

participation, incentives, debate, and closure. Formality refers to the formalization of the decision-making process (formal meetings, extensive data-gathering, operating procedures, comprehensive formal analysis, etc.) As to layering, it consists in assigning decision approval to different people. Information is related to the decision-making based on the right kind and amount of information or data. As to participation, it refers to a rather decentralized decision process involving all project stakeholders. Incentives are related to awareness of monetary and non-monetary interests, all kinds of self-interests that may motivate some of those involved in a decision process. Regarding the debate, it refers to the importance of a culture of debate and its contribution to the prevention of groupthink and false consensus associated with biased decisions. Finally, closure is related to the importance of clarity about how the decision process concludes (Sibony et al., 2017).

In the same line of thought, given the importance of strategic decisions made in the project front-end, some organizations hire external consultants to evaluate the decision-making process that they have used in the selection of a particular project concept, then advise them based on their findings (Samset, 2010, p. 157).

3.3. SOMMAIRE DU CHAPITRE 3 – RESEARCH CONCEPTUAL FRAMEWORK

Un cadre conceptuel de recherche est un guide théorique censé faciliter la tâche au chercheur en tirant son attention sur certains aspects d'un phénomène qui constitue l'objet de sa recherche. Mais comme revers de la médaille, l'utilisation d'un cadre conceptuel peut biaiser les observations et pour cette raison le chercheur doit s'en servir avec une ouverture d'esprit. Cette étude a été guidée par un cadre conceptuel qui comprenait trois dimensions - les facteurs de conception de projet, le but de conception de projet et le contexte de conception de projet[11]. La dimension de facteurs de conception de projet comprenait, entre autres, les activités qui étaient réalisées dans la conception de projet, les outils et techniques qui étaient utilisés dans ces activités et la manière dont ces activités étaient organisées (ordonnancement des tâches).

Quant à la dimension de but de conception de projet, elle correspondait à la valeur qu'un projet entendait créer (différentes formes d'innovation) tel qu'il était reflété dans les concepts de projet qui étaient sélectionnés. Enfin, la dimension de contexte de conception de projet correspondait aux facteurs qui se trouvaient dans l'environnement d'un projet ou de l'organisation mère d'un projet et qui façonnaient la conception de projet. Le cadre conceptuel utilisé dans cette étude s'est également inspiré d'un modèle générique de conception de projet qui organise cette activité en trois étapes – la génération d'idées de projet, le raffinement de ces d'idées et leur traduction en concepts de projet et enfin l'évaluation de ces concepts.

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[11] Cadre conceptuel adapté de Hanisch et Wald (2011, p. 9)

NEXT CHAPTER - RESEARCH METHODOLOGY

- TYPE OF STUDY AND UNIT OF ANALYSIS

- SAMPLING

- DATA COLLECTION

- DATA ANALYSIS

- RESEARCH CREDIBILITY

- SOMMAIRE DU CHAPITRE

CHAPTER 4 - RESEARCH METHODOLOGY

Research methodology refers to procedures, tools and techniques used by a researcher to collect, analyze, and interpret data when seeking to address research questions (Fortin & Gagnon, 2016; Creswell & Creswell, 2018). This section covers the following research aspects: first, the type of study and unit of analysis, second, sampling, third, data collection, then, data analysis, and finally, research credibility.
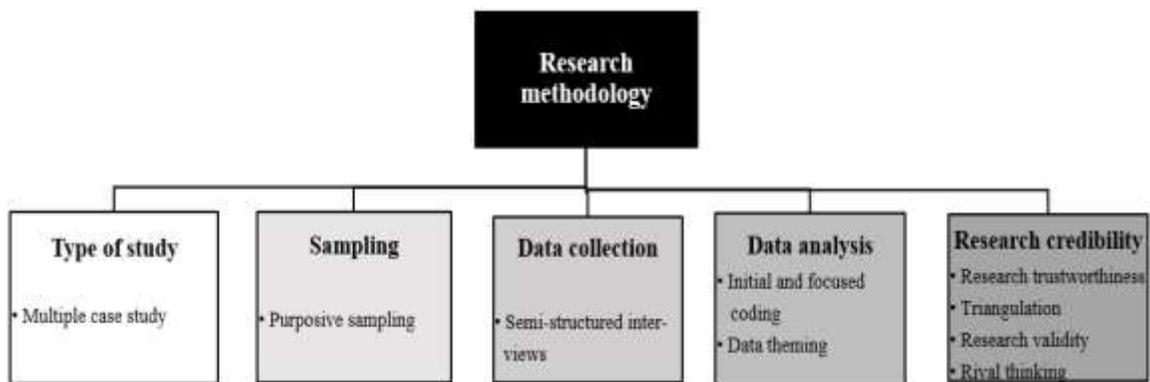
Figure 4.1. Research methodology overview

4.1. TYPE OF STUDY AND UNIT OF ANALYSIS

As already stated, my study aimed at discovering the reality of how healthcare organizations were managing the project conceptual phase in the context of digital transformation and such a study goal called for qualitative research, understood as a means for exploring and understanding what a phenomenon means to individuals in a specific context (Yin, 2016; Creswell & Creswell, 2018). Qualitative research comprises several variants and as research design for my inquiry, I have chosen a case study.

Concerning their advantages, case studies allow researchers to get insights into their subjects of interest by confronting theory and empirical data through a variety of means including direct observation in natural settings and interviews that provide information on subjective factors such as thoughts, feelings, and desires of research participants (Piekkari et al., 2009, p. 569; Yin, 2016, p. 68). Concretely, my research was realized through a multiple case study that comprised six research cases. As to the unit of analysis, i.e., the focus of my analysis, it consisted of the management of the conceptual phase of digital transformation project that had been realized by public healthcare organizations.

4.2. SAMPLING

As previously mentioned, this research consists of a multiple case study (Eisenhardt, 1989), and in this section, I first present the sampling method, selection of case sites and research participants, then, the notion of maximum variation in sampling, and finally, the determination of cases' number.

Regarding the sampling method, I have used purposive sampling, a procedure whereby research participants are selected based on their potential to provide relevant data in a particular research context (Rowley, 2012; Yin, 2016). Regarding this potential, as it was specified in my recruitment materials, eligible people were those who had, among others, witnessed the introduction of digital technologies in their workplaces, therefore, with lived experience about how their organizations had managed the conception of their digital transformation projects. So, the organizations that constituted my research settings i.e., case sites (Table 4.1) as well as research participants (Table 4.2) have been intentionally

chosen. As to the notion of maximum variation, it refers to sample heterogeneity, one of key characteristics by which to recognize a good sample, and I have strived for this in the selection of both my case sites and research participants. In relation to research settings, the organizations that I have selected differed in terms of size, and this seemed founded to me despite the debate over the correlation between the size of an organization and its innovativeness with the size seen as a double-edged sword in this relationship.

Regarding the above correlation, on one hand, large organizations have the potential to achieve radical innovation due to (their) slack resources, but original ideas are often filtered out due to a layered evaluation typical of bureaucratic organizations (Forés & Camisón, 2016). Therefore, the size of an organization is sometimes associated with incremental rather than radical innovation (Forés & Camisón, 2016). On the other hand, larger organizations can be more innovative, and this is corroborated by Hung et al.' (2014) observation about big hospitals making additional revenue out of the smaller ones by acting as their solution providers in IT due to their abundant means.

Variation among research participants increases the richness of data and I have selected heterogenous research participants, an inquiry design aligned with the multiple stakeholder model of project evaluation i.e., the idea that project stakeholders tend to see the same project differently depending on their roles in it (Samset & Volden, 2016; Davis, 2018). Regarding the selection criteria, I looked for and recruited people who had witnessed the rollout of digital technologies in their workplace in one of the following three roles: as a manager, a project core team (PCT) member or a technology user.

Concerning research cases, this study was focused on digital transformation projects and related projects, in short, projects that have led to sociotechnical organizational changes (Table 4.3). Finally, another key element of case research design is the number of cases that a researcher has to investigate. According to Eisenhardt (1989), the empirical grounding of a case study results from the richness of the data collected during an investigation and it is advisable for a researcher to study between four (4) and ten (10) cases. Regarding my research project, it has explored six (6) cases and has therefore conformed to the above guideline.

Research setting / Setting description	Organization A	Organization B
Designation	Academic healthcare organization	Community health center
Mission	To provide specialized acute and long-term health care	To provide primary health care in addition to addressing the social determinants of health through community-oriented services
Size (as of February 2023)	~ 2500 employees	~ 400 employees
Location	Canada's capital region	Canada's capital region

Table 4.1. Research settings

Participant	Organization	Role	Education	Experience[12]
Manager1	A	IT applications Manager	Master of Information Systems	> 15 years
Manager 2	B	Innovation Manager	Graduate diploma in human-centered design	> 20 years
Technology super user 1	A	Pharmacist	Details not provided	> 20 years
Technology super user 2	B	Community Developer	Master of Social Work	10 years
Technology user 1	B	Health Promoter	Bachelor of Social Work	10 years
Technology user 2	A	Nurse	Bachelor of Nursing	> 15 years
Technology user 3	A	Nurse	Diploma in Nursing	5 years

Table 4.2. Research participants

Research case[13]	Research setting	Research participant
# 1. Introduction of a medication packaging system	Organization A	Technology super user 1
# 2. Introduction of an EHR[14] for acute health care	Organization A	Manager 1
# 3. Introduction of an EHR for long-term care	Organization A	Manager 1; Technology user 2
# 4. Integration of a medication order management system (MOMS) to an EHR	Organization A	Technology user 3
# 5. Shifting the organization from on-site to cloud computing	Organization B	Manager 2; Technology super user 2
# 6. Shifting a program from in-person to video-based programming	Organization B	Technology user 1

Table 4.3. Research cases

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[12] Time spent at Organization A/B or elsewhere but in the same industry

[13] Some of the investigated cases were not qualified as DT projects but were still considered due to their potential to generate insights into a sociotechnical organizational change like DT projects

[14] EHR: Electronic health record

4.3. DATA COLLECTION

This section discusses data collection and covers four topics, namely, participant recruitment, interview, pilot interview, and interview protocol.

4.3.1. Participant recruitment

As mentioned in section 4.1, participants in my research project were found through a purposive sampling method with concern for sample heterogeneity and maximum variation. To this end, I have started by exploring potential research settings for my research project in 2021 and, managed - with the facilitation of personal contacts - to gain a footing in two (2) out of a half-dozen organizations that I had approached in Canada's capital region. The first organization – henceforth Organization A (AO) - is an academic healthcare organization that provides both acute and long-term health care and the second – henceforth Organization B (OB) -, is a community health center that provides primary health care (clinical services) and various community-oriented services (Table 4.1).

The identification of the above organizations was followed by the recruitment of research participants, and this has also been done through purposive sampling with the facilitation of personal contacts. As a result, seven (7) research participants were signed up and as shown in Table 4.2, they comprised managers, technology super users and technology (average) users.

So, how have I actually proceeded to sell my project to potential participants in order to sign up them? This goal has been achieved through a two (2)-step process, namely, communication with my personal contacts in the aforesaid organizations and communication with people who had manifested interest in my project.

Regarding my communication with my contacts in focal organizations, it consisted in emailing them materials related to the recruitment of research participants i.e., invitation to participate in my research project (Appendix 4) and the letter of research ethics approval from my school (Appendix 8). As to my communication with those who have expressed interest in my research, it consisted in emailing them the form of consent to participation in my research (Appendix 9), a document that they had to sign prior to their participation.

4.3.2. Pilot interview

To increase the chance of inquiry success, it is advisable for a researcher to pilot test their study design in the real world to discover any room for improvement and act accordingly before data collection (Yin, 2016; Creswell & Creswell, 2018). In relation to this advice, in March 2021, I conducted an interview with someone who had managed the kind of projects I was interested in, and his input helped me refine my interview questions.

At the time of our interview, this person was working as a lecturer and prior to that, he had spent many years serving as a director of the IT department in one of the teaching hospitals located in Canada's capital region.

4.3.3. Interview

In this section, I discuss interview as a research technique that I have used to gain insights into my research subject. Concretely, I first present the type of interview that I have chosen, then, the number of interviews realized, how I have conducted them, and finally, the rationale behind my decisions.

Regarding interview typology, two (2) types of interviews can be distinguished – standardized/structured interviews and non-standardized/structured interviews (Qu & Dumay, 2011; Shepherd, 2015). A standardized or structured interview is an interview technique meant to prevent interviewer bias from influencing data collection through precise question scripting and prescription of standardized behavior deemed appropriate for an interviewer to follow in all situations (Qu & Dumay, 2011). Data is collected in a rigid fashion and the interviewer reads from a script deviating from it as little as possible, asks interviewees the same questions in the same order to elicit brief answers or answers from a list. This technique is rooted in the neo-positivist research paradigm whose purpose is to discover the objective reality through the collection of unbiased data and achieve generalizability of findings (Qu & Dumay, 2011; Shepherd, 2015).

Non-standardized/non-structured interviews comprise semi-structured and unstructured interviews and allow capturing rich detail in a flexible way and adapt procedures and topics to research contexts (Qu & Dumay, 2011; Shepherd, 2015). As mentioned in section 1.5, my research was exploratory, and realized through semi-structured interviews. Regarding its philosophical foundation, this interview technique proceeds from a localist perspective considering the interview as a "construction site of knowledge" where both the interviewer and interviewee co-generate knowledge (Qu & Dumay, 2011, p. 242).

Regarding the determination of the number of interviews, a researcher needs to be pragmatic by balancing their search for rich data and participants' availability on the one hand, and their ability to collect and analyze data on the other (Rowley, 2012; Shepherd,

2015). In this regard, Rowley (2012, p. 263) suggests around 12 interviews of about 30 minutes or six (6) to eight (8) interviews of about an (1) hour each. Still, regarding the sample size in interview-based qualitative research, Bryman et al. (2019, pp. 397, 399) note the lack of consensus on this subject and this is illustrated by a study on 560 doctoral theses in which sample size varies between 1 and 95 with a mean of 31 interviews and a successful thesis with 15 interviews of one hour each. Overall, in qualitative research, rather than the number of interviews, what matters is an in-depth analysis of data with the potential to generate valuable insights into the phenomenon of interest (Bryman et al., 2019). So, what have I done regarding this interview aspect? To gain insights into my research subject, I conducted seven (7) semi-structured interviews of one (1) hour on average (40 - 90 minutes) between April and December 2022, and this is acceptable in light of the literature on the subject.

As for interview conduct, it is done in three stages, namely, introduction, interview main body, and interview closure in face-to-face, phone or video modalities following guidelines for best practice in this area (Hughes & Terrell, 2007; Qu & Dumay, 2011; Shepherd, 2015). To those who were interested in my research, I sent two (2) types of documents several days prior to the interview, namely, a research-informed consent form (Appendix 9) and an interview protocol with questions (appendix 3) to help them better prepare for our interactions. With the participants' consent, all interviews were recorded for transcription purposes afterward before data analysis. Concerning their content, my interviews consisted of the following five (5) questions:

1. *From a project design perspective,*

    i) What is the <u>process</u> by which Technology X [15]has been put in place i.e., how ideas have been generated and then translated into this technology? How do you <u>rate this process</u>, and why such a rating?

    ii) What <u>tools and techniques</u> were used/ were available for use in this process, to which extent were they used, how do you <u>rate them</u>, and <u>why such a rating</u>?

    iii) In relation to <u>tool usability</u>, what are <u>three top features</u>/characteristics that make/would make a technology attractive/user-friendly?

    iv) The approval of a project concept (a technically feasible project idea) in the context of digital transformation is a <u>big decision</u> due to its strategic implications ($, workplace dynamics etc.). So, could you tell me about any <u>principles</u> that your organization has followed while approving the project concept behind Technology X? What is the <u>rationale behind these principles</u>?

2. *From a project goal perspective, <u>what form of innovation</u> was your organization seeking through project conception in Technology X case?*

3. *From a project goal perspective, lived experience with organizational change varies among the affected people. So, <u>how has the rollout of Technology X affected your work</u>?*

4. *From a project goal perspective, the concept of project success means different things to different people. So, to you, <u>what does it (project success) mean</u> in the context of*

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[15] A specific technology that had been introduced in an organization and about which a participant had agreed to discuss beforehand.

healthcare digital transformation?

5. *From a project context perspective, could you tell me about <u>extra-organizational</u> <u>factors that have influenced project conception</u> in Technology X case?*

4.4. DATA ANALYSIS

According to Yin (2016), data analysis consists of two (2) types of activities, that is, data compilation i.e., the organization of empirical materials, and data coding i.e., making sense of these materials through abstraction (Table 4.4). This section comprises three parts, that is, data compilation, data coding, and data analysis outputs, presenting the theoretical foundation of the subject first, then what was actually done about it.

4.4.1. Data compilation

Theory about data compilation

Data compilation consists of three main activities – creating sets of records, familiarizing oneself with empirical data, and creating a glossary - with the creation of a database of orderly evidentiary materials as a result (Yin, 2016). Regarding the sets of records, they are organizing devices that group data in a meaningful way based for example on the time of their collection, on their sources or on the focus of the study (Yin, 2016). As to the familiarization with data, it is the result of a researcher sufficiently immersing themselves in evidentiary materials to make sense of them (Yin, 2016). Concerning the creation of a glossary, it consists in explaining key concepts found in the data to ensure a consistent use throughout data analysis.

Actual data compilation

How have I actually compiled data in this research? This activity comprised three tasks, that is, interview transcription, validation of the interview's content and creation of a repository for interview transcripts. Interview transcription has been aided by YouTube Studio, a multipurpose application used for content creation, and the validation of interview content is done through email exchanges with participants. Finally, the repository of interview transcripts consisted of a database that I have created on my computer and where these transcripts have been kept in secured folders.

4.4.2. Data coding

Theory about data coding

Data coding is a process of assigning essence-capturing labels to chunks of data (Saldaña, 2016) and Yin (2016) distinguishes four levels of codes. Level 1 or initial codes also known as open codes are words or phrases close to raw data (Corbin & Strauss, 1990; Saldaña, 2016; Yin, 2016). As to level 2 or category codes, they consist of abstract terms that group several initial codes based on their similarity (Yin, 2016). This level corresponds to Corbin and Strauss' (1990) and Saldaña's (2016) axial coding in which initial codes are assembled into categories with three types of properties - actions, conditions, and consequences - of the phenomenon of interest. According to Corbin and Strauss (1990), a theory's explanatory power results from the conceptual density of related categories - the degree of detail and variability in actions, conditions and consequences associated with the phenomenon of interest. Level 3 codes or themes are meaningful descriptions resulting

from the combination of related categories with increased abstraction (Yin, 2016). As to level 4 codes or theoretical statements, they are the highest level of abstraction in the coding process and link research findings to the extant literature (Yin, 2016). This level corresponds to Corbin and Strauss' (1990) selective coding and Saldaña's (2016) theoretical coding, a process meant to create a core category i.e., a highly abstract concept capturing the essence of the whole data. Data coding is associated with a variety of notions among others, predetermined and emerging codes and memoing.

Regarding predetermined and emerging codes, the former refers to codes that a researcher has in their mind prior to analyzing data based on their knowledge on the phenomenon of interest and the latter to codes derived from empirical evidence (Creswell & Creswell, 2018). These codes can be used separately or in combination and this brings to the forefront the controversy over the role of extant literature in qualitative research. According to Thornberg (2012, p. 249), some authors believe literature review should be postponed till the empirical phase has remarkably advanced to ensure unbiased research but to him, there is "a difference between an open mind and empty head" i.e., an investigator's theoretical background does not necessarily make them selective while collecting and analyzing data as longer as they stay grounded. For a researcher, staying grounded refers to abiding by the principle of ''empirical figure and literature background'', that is, remaining focused on data, not on literature and letting data ''speak for themselves'' (Thornberg, 2012). Langley (1999) and Avgerou (2013) feature among those sharing Thorberg's (2012) view on this topic and believe good theories can be developed by mobilizing both inductive or data-

driven approaches and deductive or theory-driven approaches - by creatively blending general theories and concepts from empirical data.

Concerning memoing, data analysis is an emergent and iterative process and for this reason, memoing i.e., the creation of analytic memos – documents in which a researcher records any relevant thoughts regarding their data – is a recommended practice (Saldaña, 2016; Yin, 2016).

Actual data coding

As to how I have proceeded with data coding, this process consisted of two types of activities - familiarizing myself with data and labeling them with meaningful abstractions besides constant memoing.

Familiarization with data is a prerequisite for any proper data coding, and this has been achieved by two means, that is, a thorough reading of interview transcripts and the validation of my understanding by research participants. The next step consisted in labeling my data with predetermined and emerging codes in two (2) stages, namely, concept, and focused coding, and this has generated more than twenty (> 20) initial codes, and seven (7) category codes, respectively (Table 4.4). Concept coding consists in marking blocks of data with abstract yet meaningful labels i.e., essence-capturing words or phrases and focused coding in grouping initial codes in categories based on their similarity (Saldaña, 2016). My data analysis has concluded with data theming i.e., the generation of consolidated meanings from seven (7) category codes (Saldaña, 2016; Yin, 2016) first, then five (5) themes (section 5.1).

Finally, throughout this project, new insights into its various aspects kept coming to my mind and for recollection purposes, I have always created analytic memos about those ideas i.e., documenting them. Data coding was one of my project parts to which this has particularly applied making memoing a constant exercise in this process.

Data analysis stage	Task	Output
Data compilation • Text generation • Validation of interview's content	• Transcription of recorded interviews • Follow-up with research participants to clarify interview's content	Database of interview transcripts
Data coding • Concept coding • Focused coding • Data theming	• Marking chunks of data with essence-capturing labels (words or phrases) • Grouping initial codes into categories based on their similarity • Abstraction of data to get the essence of research findings	• > 20 initial codes • Seven (7) category codes • Five (5) themes

Table 4.4. Data analysis process

4.4.3. Data analysis outputs

As previously indicated, data analysis has been done in two (2) stages and as shown in Tables 4.4 and 4.5, this process has resulted in dozens of initial codes first, then seven (7) category codes, and finally five (5) themes.

Study case & participants	▪ Projects for improving patient care - Medication packaging system (case # 1) - EHR for acute care (case # 2) - EHR for long-term care (case # 3) - MOMS (case # 4) ▪ Research participants Manager 1 ; Technology super user (TSU) 1 ; Technology user (TU) 2 ; TU 3	▪ Project for shifting an organization from on-site to cloud computing (case # 5) ▪ Research participants Manager 2; Technology super user (TSU) 2	▪ Project for shifting a community-oriented program from in-person to video-based programming (case # 6) ▪ Research participant Technology user (TU) 1
Form of innovation	• Process innovation -Improved workflow in health care delivery	• Business model innovation -Organizational efficiency	• Process innovation -Safer delivery of health promotion services
Meaning of project success	• Project effectiveness -Respect of project scope -Realization of predetermined goals -Satisfaction of project users reflected in a high rate of a project deliverable's use • Project efficiency -Project delivered on time and budget	• Project effectiveness -Meeting the goal set during project initiation in terms of the rate of people using a specific tool • Project efficiency -Maintaining productivity at lower costs	• Project effectiveness -Solving project intended users' problems • Project efficiency -Helping service provider to deliver numbers in their work
Human resources	• Skilled manpower -People with IT skilled -People with project management skills		• Distributed digital talent -Dependable people in IT department -Technology-savvy people in the program
Intangible resources	• Organization's strategy -Priority of patient safety -Importance of efficient workflow • Organizational culture -Supportive change leadership -People's readiness for change • PFE organization capability -PFE with a proper structure (stages): A five (5)-stage structured process according to Manager 1, and structure unknown to other participants • Principles followed by the organization	• Organization's strategy -Concern for the reduction of IT- related costs -Importance of connecting workers in a multi-site health center • Organizational culture -People's readiness for change	• Organizational culture -Supportive change leadership -People's readiness for change

when selecting project concepts or making any other big decisions[16] Consideration of the following: -Consideration of organization's strategy statement (goals, mission, vision, values) -Data -Health ministry's directives -Critical issues e.g., IT-related threats -People's readiness for change -Resource availability ($, manpower) -Concern for efficiency Profitability[17]: potential of a technology to generate revenue for an organization ● Project leadership rating Manager 1; TU 2 -Process rating Good -Reasons for rating Participatory process[18] TSU 1; TU 3 -Process rating Poor -Reasons for process rating Process hijacking[19]	Principles followed by the organization when selecting project concepts or making any other big decisions[20] Consideration of the following: -Data -Experience of business partners (mimetic isomorphism) -Concern for efficiency ● Project leadership rating Manager 2; TSU 2 -Process rating Poor -Reasons for rating Process hijacking	● Principles followed by the organization when selecting project concepts or making any other big decisions -Consideration of organization's strategy statement (mission, vision, values, goals) ● Project leadership rating TU 1 -Process rating Good -Reasons for rating Attribution of dispositional legitimacy[21] to change leadership
Tangible resources	● Financial resources - Funding (internal or external)		

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[16] Decisions with potential to noticeably influence the ability of an organization to achieve its mission

[17] Though typically viewed as not-for-profit organizations, publicly funded hospitals are interested in and effectively make money (TU 2)

[18] The employee has been consulted either directly or indirectly through a TSU from their department

[19] Process shaped by the most powerful in the organization to the exclusion of subordinates who better understand workflow than them

[20] Decisions with potential to noticeably influence the ability of an organization to achieve its mission

[21] Belief that someone is wise and acts with others' best interests at heart

	• Tools/techniques -Meetings -Focus groups -Brainstorming -Interviews -Surveys -Project feasibility analyses -Presentations -Proof of concept -Prototyping -SBAR form • Tools/techniques rating -Good (Manager 1; TU 2) -Fair (TSU 1; TU 3) • Reasons for tools/techniques rating -Good: means' effectiveness -Fair: effective means misused by change leadership • Value and technology attractiveness (TA) -Increasing productivity -Reducing tedious tasks -Increasing workplace safety • Information display and TA -Findability -Presentation of information in multiple formats -One stop shop for information • Adoptability and TA -Cross-device application User control and TA -Customizable technology • Data input	Tools/techniques -Presentations -Meetings -Pilot project Tools/techniques rating -Fair Reasons for tools/techniques rating - Change leadership misusing otherwise effective means • Value and technology attractiveness (TA) -Provision of functionalities needed for task realization Information display and TA[22] -Information high density -Minimalist design -Intuitive design/self-evidency -Consistent design • Data input and TA -Technology thoroughly tested for debugging prior to launch into the market	• Tools/techniques -Print materials distributed to intended users of Zoom application to explain them its use -Meetings • Tools/ techniques rating -Good Reasons for tools/techniques rating -Means' effectiveness • Information display and technology attractiveness (TA) -Large user interface (UI) -High-resolution images -Multiple windows

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[22] Opposite preferences regarding the amount of information displayed with Manager 2 preferring basic features (minimalist design) and TSU 2 most of relevant features displayed in application design mode i.e., by default (information high density)

	-Undo functionality to rectify errors		
PESTEL factors	• Environmental factors -Reducing the use of paper as a response to calls for environmentally friendly solutions • Social factors -Societal trend: everybody going digital • Technological factors -Existence of the right technology in the market Technological factors -Existence of the right technology in the market	• Economic factors -Soaring building rent in the region[23] • Environmental factors -Organization's headquarters located in the area prone to inclement weather[24] • Economic factors -Soaring building rent in the region[25] • Legal factors -Obligation to ensure data security and privacy in accordance with PHIPA[26] • Social factors -Cross-industry publicity of lean business model (LBM) -Adoption of remote work to respect social distancing in compliance with public health measures against Covid 19	• Economic factors -The program experienced this change after the health center had lost a facility in which it had been operating to another organization • Environmental factors -Community members preferring video-based over in-person service during Winter • Social factors -Brand popularity: some employees prefer Zoom over Teams for video-conferencing due to its worldwide reputation
Institutional isomorphic forces	• Coercive isomorphism -Compliance with funders e.g., provincial government • Normative isomorphism -Compliance with healthcare accreditation bodies • Mimetic isomorphism -Emulating successful partners when unclear about how to proceed in a particular situation	• Mimetic isomorphism -Emulating successful business partners when faced with uncertainty	

Table 4.5. Data matrix

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[23] With cloud computing employees can work from their homes and allow their organizations to save on the costs of office rent
[24] With cloud computing, people would be able to work safely away from office during bad weather
[25] With cloud computing employees can work from their homes and allow their organizations to save on the costs of office rent
[26] PHIPA: Personal Health Information Protection Act

Legend

= Category codes related to the project front-end design

= Category codes related to the project front-end context

= Category codes related to the project front-end goal

<div align="center">**4.5. RESEARCH CREDIBILITY**</div>

In the context of paradigm wars i.e., the competition of research philosophies for hegemony, positivists have traditionally criticized constructivists for lacking methodological rigor (Guba & Lincoln, 1994; Johnson et al., 2006, p. 133; Sinkovics & Alfoldi, 2012, p. 828) and it is up to them – constructivists - to ensure the credibility of their work. Research credibility is the belief that the findings and conclusions of a study reflect reality due to the impression that the process used in research was appropriate for data collection, analysis, and interpretation (Yin, 2016). To ensure this credibility, a researcher can use strategies such as concern for trustworthiness, triangulation, research validity and rival thinking throughout the research process (Yin, 2016).

4.5.1. Research trustworthiness

Research trustworthiness is the overall impression that an investigation has been properly designed and conducted and this can be ensured by showing the logical chain of evidence i.e., the traceability of the research process through a detailed documentation of research (Dubé & Paré, 2003) by different means including the use of a computer-assisted qualitative data analysis software (CAQDAS) (Sinkovics & Alfoldi, 2012). According to Yin (2016), trustworthiness can be demonstrated by different things among others, the provision of information about the choice of a research subject, the selection of a research setting and participants, the authenticity of the researcher's work reflected in the quality of data sources and a sufficient engagement of the researcher with participants. In this inquiry, research trustworthiness has been ensured by presenting information on various research

aspects including details on what has motivated the choice of my research subject, the settings of my research, the selection of research participants, data collection and analysis.

4.5.2. Triangulation

Triangulation is the search for the intersection of different reference points to know reality (Yin, 2016). Triangulation can be achieved by different approaches such as data triangulation i.e., the combination of various sources of data such as interviews, observations, and document analysis, investigator triangulation i.e., consulting with co-investigators, theory triangulation, that is, looking at the same data through different theoretical lenses and finally methodological triangulation, i.e., the use of different research methods (Yin, 2016, p. 87; Creswell& Creswell, 2018).

In this research, data triangulation was done by examining the extent to which data from various sources converged to the same evidence. This was achieved through three approaches to triangulation: document analysis, observation (finding physical artifacts) and comparison of narratives from research participants[27].

Data triangulation through document analysis was based on documents falling into the following categories: organizational annual reports, specialized periodicals, employee newsletters, webpages, research reports, presentations in project meetings, and project governance policies. Regarding data triangulation through observation, this was done by establishing the corroboration of interview narratives by various physical artifacts[28].

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[27] A recognized approach to data triangulation (Creswell & Creswell, 2018, p. 200)
[28] Observation of tangible things associated with an organization such its location, what is found around etc.

Finally, data triangulation through comparison of narratives from research participants was realized by examining the convergence of opinions in participants' accounts. So, as illustrated in Appendix 2, this study has strived for research credibility by using different approaches to data triangulation.

4.5.3. Research validity

As for the validity of a study and its findings, it refers to concern for the correct interpretation of data to ensure the study's conclusions accurately represent the real world that was studied (Yin, 2016). Study validity can be ensured by various strategies including prolonged fieldwork to get in-depth understanding of phenomena through repeated observations and interviews, triangulation through the collection of converging evidence from different sources, the use of numbers when quantifying phenomena, comparison of results across different settings, groups or events and project review, the validation of the meaning of data by their sources to prevent researcher's misinterpretation (Dubé & Paré, 2003, Rowley, 2012; Yin, 2016). Another strategy for ensuring study validity proceeds from the verbatim principle, a principle that commends researchers to capture interviewees' words verbatim to get their exact meaning instead of relying on the inferred meaning when presenting their findings (van der Blonk, 2003; Yin, 2016). To address the concern of study validity in this research, I have combined strategies such as the triangulation of data sources (appendix 2), the validation of my interpretation by research participants and the inclusion of extensive verbatim in my findings.

4.5.4. Rival thinking

Finally, rival thinking is a skeptical attitude that leads a researcher to look critically at their original interpretation of data, original assumptions, and interviewees' responses (Yin, 2016). This attitude aligns with the assumption-challenging mindset associated with systematic problematization (Alvesson, 2003) or counterfactual reasoning (Cornelissen & Durand, 2014) known for its potential to generate frame-bending or frame-breaking theories. Rival thinking is important, especially in the context of interviews, viewed from a constructivist perspective as the social construction of reality rather than simple tools for data collection (Alvesson, 2003; Qu & Dumay, 2012; Rowley, 2012). In this research, I have used this thinking while pondering the appropriateness of project leadership in research case # 5 (Table 4.3). Usually, people need to have a say in any decisions that affect them (democratic leadership) and to be guided at a pace deemed appropriate (authoritative leadership) but, to a certain extent, emergencies such as the one that was caused by the outbreak of COVID 19 call for autocratic leadership (Goleman, 2000). In research case # 5, project conception and implementation were accelerated by the outbreak of COVID 19, and participants were dissatisfied with what they saw as autocratic leadership. On one hand, I understood their dissatisfaction but, on the other hand, I also tried to make sense of such a leadership style given the context in which it was used. So, I remained undecided about the adequacy of project leadership in this case due to rival thinking.

4.6. SOMMAIRE DU CHAPITRE 4 – *RESEARCH METHODOLOGY*

Pour répondre à mes questions de recherche, j'ai utilisé une méthode de recherche qualitative, plus précisément, une étude de cas multiples de type exploratoire. L'unité d'analyse, c'est-à-dire le centre d'intérêt de ma recherche, était la gestion de la phase conceptuelle des projets de transformation numérique du secteur public de soins de santé et la collecte des données s'est faite au moyen d'entrevues semi-structurées avec sept répondants qui avaient participé dans six projets (cas étudiés) de deux établissements publics de soins de santé situés dans la région de la capitale du Canada. Ces entrevues se sont réalisées par vidéoconférence en 2022 et duraient une heure en moyenne. La sélection des répondants a utilisé la méthode d'échantillonnage par choix raisonné.

Quant aux cas qui ont été étudiés, ils appartenaient aux catégories de projets de transformation numérique, de projets d'intégration et d'autres, tous vus comme processus de changement organisationnel à caractère sociotechnique. Concernant l'analyse des données, cette analyse s'est réalisée au moyen de trois méthodes de codage des données - le codage conceptuel, le codage focalisé et la thématisation et a utilisé deux types de codes – les codes prédéterminés et les codes émergents. La crédibilité de recherche peut être assurée par différents moyens, et dans cette étude cela a été réalisé par trois modalités - la validation de mon interprétation des données auprès de répondants, la triangulation des données par la comparaison des propos de répondants et de l'analyse des documents. Les documents analysés appartenaient à ces quatre catégories : les rapports annuels d'activités des établissements étudiés, les bulletins d'information internes de ces établissements, les rapports de recherche et les articles tirés de la presse locale.

NEXT CHAPTER - RESEARCH RESULTS

- TAKEAWAYS FROM RESEARCH

- RESPONSES TO RESEARCH QUESTIONS

- SOMMAIRE DU CHAPITRE

CHAPTER 5 - RESEARCH RESULTS

This chapter presents the finding of my investigation and comprises two (2) main sections, namely, takeaways from research and responses to research questions.

5.1. TAKEAWAYS FROM RESEARCH

Research generates insights into a phenomenon of interest by processing data into information first, then information into knowledge (Sanchez & Heene, 2004, p. 84). This process concludes with data theming i.e., getting a consolidated meaning of research findings and that is what qualitative research is all about. So, this section presents the essence of what has emerged from my research findings in the form of the following five (5) themes (Table 5.1):

i) *Project front-end as a project phase with a challenged leadership and largely unknown to project stakeholders*

ii) *Strategy statement and finances as the most important factors in organizational big decisions*

iii) *Project front-end activities as a process unfolding in a multifactorial context*

iv) *Project front-end activities as a creative process for incremental innovation in process and business model areas*

v) *Project success as a measurable phenomenon*

To clarify matters, the content of this section reflects opinions that had been expressed by seven (7) research participants. So, any number or relative frequency found in this section refers to this figure.

Object of inquiry	Findings
Structure of the project front-end (PFE) and rating of leadership in PFE activities (PFE design)	-A five (5)-stage project phase: i) Generation of a project idea ii) Screening of the project idea iii) Translation of the project idea into project concepts iv) Selection of a project concept v) Approval of the project concept -Structure unknown by most participants -Project leadership generally challenged due to its autocratic nature
Principles followed by organizations when making big decisions (PFE design)	Strategy statement and finances as key drivers behind organizational decisions
Extra organizational factors that influence project conception (PFE context)	Political, economic, social, technological, environmental, and legal (PESTEL) factors
Type of innovation realized through healthcare digital transformation projects (PFE goal)	Incremental innovation in process and business model areas
Meaning of project success (PFE goal)	The extent to which one is satisfied with project outcomes with objective indicators

Table 5.1. Takeaways from research

5.1.1. Project front-end as a largely unknown project phase with a challenged leadership

As reflected in their responses to my research questions, most people knew little about the

structure of the project front-end in digital transformation i.e., its stages and associated

activities, and rated differently the style of project leadership that was used to manage this project phase. Only one (1) participant, that is, less than 20% of interviewees knew the structure of this phase and was able to elaborate on project front-end stages and associated activities and this shows the extent to which project conception is unknown to different project stakeholders. Regarding the leadership style that was used in the conception of digital transformation projects, it was a polarizing topic with almost 60% of participants reproving it outright due to what they perceived as process hijacking. Explicitly, they noted that project conception was dominated by the most powerful in their organizations to the exclusion of subordinates who, in general, were in a better position to know what was actually needed for a successful process. So, to a great extent, the project front-end of healthcare digital transformation is an unknown project phase with contested leadership.

5.1.2. Centrality of strategy statement and concern for finances as leading factors in organizational big decisions

Regarding the logic underlying the selection of project concepts or any other organization's big decisions, the centrality of strategy statement and concern for finances constitute the two (2) most important drivers. The first driver refers to the importance for a project concept or a decision to align with the organization's strategy statement (organizational goals, mission, vision, and values) and has been mentioned by almost 50% of participants. As to the second driver, it relates to the importance of financial matters in the eyes of organizations. These matters cover notions such as the potential of a project to help an organization reduce the costs of its operations, the availability of external funding for the project or co-funding, and, even - according to one (1) participant - profitability e.g.,

valuing a technology based on its potential to increase revenue. This principle was mentioned by almost 60% of research participants.

5.1.3. Project front-end activities as a process unfolding in a multifactorial context

As with any activity, the conception of digital transformation projects does not take place in a vacuum, and participants have observed the impact of organizations' macroenvironment factors such as political, economic, social, technological, environmental, and legal (PESTEL) factors on this process.

Regarding the effect of political factors on project conception, one (1) participant has related a project that allowed six (6) hospitals in the same local healthcare network to go live with the same electronic health record (EHR) around 2015. This project was conceived after the government, both at the provincial and the federal level, had expressed its commitment to e-health and this shows how political factors shape project conception in healthcare digital transformation.

Concerning the impact of economic factors on project conception, one (1) participant has related how a steady increase of real estate value had led to the support of a project concept whose key selling points included the potential to help their organization save on workspace rent by enabling teleworking. The project consisted in shifting the organization's information technology (IT) from on-site to cloud computing and was initiated by the top management in a top-down fashion as a step towards a lean business model (LBM), a concept that was a hot topic in their industry as a strategy for business

efficiency. So, economic factors feature among those influencing the conception of digital transformation projects in the healthcare industry.

Social factors also affect the conception of digital transformation or related projects (integration projects/integrated information projects), and this is illustrated by the case of a community-oriented health program that has shifted its service delivery from in-person to a video-based modality. When asked about what has motivated their organization to choose a particular technology brand among a variety of alternatives to enable this change, one (1) participant mentioned the good reputation that the brand in question had gained worldwide. So, the popularity of a technology brand contributes to its diffusion in society, and this shows the potential of social factors to shape project conception in healthcare digital transformation.

Referring to a medication packaging system that had been introduced in their organization without a proper project conception, one (1) participant has recognized the contribution of technological factors to the quality of project conception in healthcare digital transformation. Concretely, they have mentioned the availability of the right technology in the market, i.e., a technology suited to the client's needs, and the involvement of a technology vendor knowledgeable about their client's organizational culture and workflow. So, technological factors affect the conception of digital transformation projects in healthcare organizations.

Environmental factors have the potential to shape project conception, and this was observed in the context of the previously mentioned project whose objective was to adopt a lean business model (LBM). According to one (1) participant, their headquarters were in

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an area prone to severe weather conditions and those who were concerned with that issue supported the project concept for cloud computing as it was associated with the possibility for them to work remotely from safer places such as their homes. So, environmental factors also influence project conception in healthcare digital transformation.

Finally, legal factors were also mentioned among those shaping the conception of digital transformation projects in the healthcare industry. Regarding these factors, three (3) interviewees, that is, almost 50% of research participants have mentioned the obligation of their organizations to comply with regulations related to the protection of personal health information. According to one (1) participant, their organization had always taken seriously anything related to privacy with the person in charge of privacy matters being automatically part of any managers' committees responsible for screening any project ideas requesting digital transformation. So, legal factors feature among those affecting the conception of digital transformation projects in healthcare organizations.

5.1.4. Project front-end activities as a process towards incremental innovation in process and business model areas

"*If it's not broken don't fix it*" goes a popular saying and public healthcare organizations seem to follow this wisdom with the prevalence of incremental innovation in process and business model areas as a result. Process innovation has been realized in both organizations that constituted my research settings. In the first organization - an academic healthcare organization – a patient-oriented process innovation has been achieved through three (3) digital transformation projects whose objectives were to improve workflow in acute and long-term health care units. In the second organization - a community health centre –

process innovation has been realized when a community-oriented health program initiated video-based programming as a strategy to surmount some obstacles in organizational environment. As to business model innovation, it was achieved in the second organization also with its shift from on-site to cloud computing as a strategy to improve organizational efficiency through a lean business model (LBM).

5.1.5. Project success as a measurable phenomenon

As already mentioned, the meaning of project success was one of my subjects of interest and this was part of what I intended to discover through this exploratory research. Project success has been defined in different terms, but all participants referred to a bidimensional construct i.e., a concept made of both qualitative indicators such as the perceived usefulness of a certain project deliverable and quantitative indicators e.g., the rate of those using that deliverable. In sum, project success is the extent to which one is satisfied with project outcomes with objective indicators.

5.2. RESPONSES TO RESEARCH QUESTIONS

As already mentioned, my research problem has highlighted several knowledge gaps in my object of inquiry and this section addresses these gaps by presenting responses to five (5) related questions.

5.2.1. *Question # 1: In relation to the project front-end design, what is the structure of the project front-end, activities, and means used; how do project stakeholders rate this process and why?*

Concerning the structure of the project front-end (PFE) in healthcare digital transformation (HCDT) and associated activities, only one (1) out of seven (7) research participants

(*Manager 1*) was able to indicate different stages of this project phase and what is done in each of them. As shown in Table 5.2, this project phase comprised five (5) stages with a series of activities from the generation of a project idea to the approval of a project concept destined for project implementation.

Project front-end stage	Project stakeholder	Project artifact
1. *Generation* of a project idea and its communication to unit manager	Project initiator	Documentation of the project idea as a problem/opportunity by the manager
2. *Screening* of the project idea	Managers' committee (MC)	Request by MC to top management to create a working group to refine the project idea if deemed relevant
3. *Translation* of the project idea into project concepts/other solutions[29]	Working group	Document e.g., *SBAR[30]form* containing solutions to the need that was expressed by the project initiator
4. *Selection* of a project concept/other solution	Managers' committee	Informing top management of the project concept selected or the business unit concerned of another solution
5. *Approval* of the project concept	Top management	Funding approval for project implementation

Table 5.2. Project conception process

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[29] Existing procedures
[30] Situation-Background-Assessment-Recommendations

Concerning the means used in PFE activities, participants have mentioned a variety of tools and techniques including focus groups, brainstorming, interviews, surveys, project feasibility analyses, presentations, proof of concept, prototyping and SBAR form.

As to the appreciation of PFE process, participants held divergent opinions about the leadership style that was used in their projects. Some participants were satisfied or indifferent about the process of project conception but the majority, that is, about 60% of them, were dissatisfied with it due to what they perceived as autocratic leadership.

The satisfaction with project conception was associated with either a good understanding of this process or just confidence and the benefit of doubt given to project leadership:

> [Alluding to the participatory nature of project conception in his organization, one participant said:] In a hospital culture you talk about okay what is your current workflow? What is your desired workflow? What is your objective? So, typically, when the hospital or the leadership tries to do this assessment, they try to understand the objective of that (Manager 1).

> [In response to the question whether she had been consulted for input to the conception of an EHR project, another participant said:] No no no no. They cannot ask you [as technology average user] before because you don't know it, you don't know […] they contacted the people [technology super users] before coming, they told them the difference of what it was going to do, they told them before of course (Technology user 2).

As to the dissatisfaction with project conception, it was associated with the perception of a process hijacking i.e., those in managerial positions seen as selecting project concepts unilaterally, then ensuring their implementation based on their power:

No, I don't think so, not really, it [the project conception] was very much top-down, it was very much "*this is what we're doing*," and it was just implemented. There was very little design discussion, at least from what I could see. I think there must have been some amongst the IT team and maybe our corporate services, but it wasn't anything that was apparent? to me as a manager (Manager 2).

I think sometimes the stakeholders are not necessarily targeted properly you have to realize who will have the most information within your organization to talk about workflows. They're going to bring managers or directors [executive sponsors] because they're the decision people right who own the budget but sometimes, they forget to go get the information right from where the person works. I find that they're late in bringing on people who actually do the job (Technology super user 1).

So, I've been in a lot of [project] core teams at the very beginning of the journey [digital transformation], but there was always, I think, a decision made in terms of "we bought this" or "we're looking into that type of technology." I don't know what it takes prior to that to be honest (Technology super user 1).

So, I design everything, but I was told "*we gonna buy a packager*." Okay, I'm not thinking about "*is there other technologies?*" […] We had a fair of vendors, and we selected the one that suited the most our needs but the concept of buying

workstation on wheels was imposed on the [project] core team at the beginning. Just a little step before "*why do you do this*" I was not involved (Technology super user 1).

I think there were some discussions during all staff meetings and emails, but I don't remember anything else. I feel like the discussion was one side with little opportunity for employees to share their input. The communication was around selling the product instead of open dialogue. It felt like "*this is what we are using moving forward so get used to it.*" (Technology super user 2).

Still regarding dissatisfaction with project leadership in project conception, *Technology user 3* has voiced it in the context of a project that integrated a medication order management system (MOMS) into an electronic health record (EHR) of another organization in which she was previously working back in 2021. She said this change has reduced her workload in addition to the elimination of medication errors which were attributed to illegible handwritten medical prescriptions but added she would have appreciated it if she had been consulted for input to the conception of this project. Concretely, she said that she had seen a system with a more intuitive user interface, and that she could have talked about this if she had been given a chance to shape this project. Still in relation to autocratic leadership, some participants have mentioned several negative consequences among others, the waste of resources, and the nonacceptance of project deliverables. Regarding the waste resources, *Technology super user 1* has related how her organization had lost substantial amounts of money due to autocratic leadership:

We used to be in a carded system that we were providing for a month then our clientele changed in terms of length of stay and acuity so that was not something that was meaningful anymore, it was too difficult to maintain all the changes. So, we went with a unit dose system, so they bought a packager [a medication packaging system]. The machine collected dust for probably 2 years before we implemented it because there was no project plan. So, they had the budget they bought the machine not even going to investigate "*is it the best machine?*" Once you have a machine that costs you $200,000 you have to do something about it. So, even the space was inappropriate we needed to relocate the pharmacy in order to put that beast in this, in the center of that. So, that's why it took so long because there's kind of a trickle-down effect. We got the budget approved but nobody knew what it would take to implement that. We knew that it was not sustainable the way we were practicing but nobody realized that that machine would have that type of involvement [a so challenging implementation]. So, that's why it took forever before a project office was put in place for that machine. We learned from that experience, in the subsequent projects when we installed dispensing machines on the unit or when we went with a new narcotic control system, all pieces of equipment were thought of in a project office prior to bringing the machine over (Technology super user 1).

As to the association of autocratic leadership with the nonacceptance of project deliverables, it has been observed by *Technology super user 1*. In the same vein, *Technology super user 2* found that many people were still resisting some of Microsoft 365

applications offered by a cloud computing project almost three (3) years after the completion of this project:

> One thing that I find that makes the projects successful is how much the people affected by the project embrace the journey. So, if there's a lot of resistance no matter how much time and effort and how nice you're going to design your project if the ultimate person who is being affected by your project is not on board, they're going to make it fail. So, and it happened for us in the past where, I don't think we understood how much change it was required in terms of workflow and how not ready people were and or not interested that you do all that and it was like good project office good project manager excellent training but ultimately no one was using it. So, if you haven't made sure that you have that support from your end user, it's never going to be successful (Technology super user 1).

> Co-workers told me flat out that they don't like the change. I was also seeing people more silent during meetings but clearly showing physical signs of annoyance and frustration. I have also found that many co-workers still do not use all the apps within 365 including Teams, Sway, and Forms (Technology super user 2).

To summarize, in terms of its structure, the project front-end has been described as a project phase with five (5) stages but this structure was generally unknown to project stakeholders. These stages are, the generation of a project idea, the screening of the project idea, the translation of the project idea into project concepts, the selection of a project concept, and the approval of the project concept. As to the means used in project front-end activities and their appreciation, they consisted of a variety of tools and techniques with a rating of

usefulness that varied among users. Finally, the style of leadership used in project conception was generally viewed as autocratic and this negatively impacted the acceptance of project deliverables.

5.2.2. *Question # 2: In connection with the project front-end design, what principles do organizations follow when selecting project concepts or making any other big decisions?*

Regarding principles on which organizations base the selection of project concepts or any other big decisions, participants have mentioned a number of drivers, mainly related to two (2) concepts - strategy statement and concern for finances.

Regarding how strategy statement drives organizational decisions, the more a project concept or any other big decision is aligned with strategy statement, the higher its chance to be supported.

> Not every idea turns into a project so, the alignment of the project objective with Organization A's mission and goals is mandatory, it's a must and [Organization A] has its goals published on our external website but, they usually are about the quality of care of our patients, innovation, and learning, three (3) top priorities for [Organization A] (Manager 1).

> I think it always comes from strategic planning like they have a review of those strategic goals in terms of like "*what are we perceiving our organization to be at a certain time? So, where do we want to invest our energy?*" So, I think that's where the selection of the projects is going to come from (Technology super user 1).

Well, they definitely follow something. I'm not with the CEO and I'm not with the directors, I'm under the director yes so, I don't know how they make their decisions, I would hope they make strategic sound decisions. When you go to our website, we have a vision statement and a mission statement, we definitely work to stay in line with those and the strategy in "*are we delivering what we need to deliver to the community and to everyone?*" (Technology user 1).

As above mentioned, concern for finances has been cited as another key driver in organization's decision-making, and a project concept or any other big decision is likely to be supported if it is based on data and incarnates ideas such as cost effectiveness or profitability. So, when asked about what had made her previous employer choose a particular medication order management system (MOMS) *Technology user 3* was unclear about the exact reason but believed the system was probably selected due to its price competitivity. Three (3) other participants have also cited the importance of finances for organizations when selecting project concepts or making other big decisions:

Yeah, I would say cost has to be one of the biggest ones (principles) especially for a nonprofit. I think utility, so you know how useful this is going to be for not just one part of the organization but the entire organization, for all different teams within the organization (Manager 2).

[…] we have to do research first before we just jump into a new tool. The whole process how they came up with the big decisions yeah, I think again that comes down to weighing the pros and cons, looking at efficiency, effectiveness, and risk assessment […]. I think part of it too is looking at market trends, you know, "*what*

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are other organizations doing. Has this benefited them?" There is a coalition of Community Health and Resource Centers there's 13 across the city I do feel we look at each other and collaborate on things and we share information about "*was this tool effective, should we implement it.*" So, I do think you look at partners as well to see how they are doing things (Technology super user 2).

I don't think they follow any system but I'm sure the budget for it [a technology] or something before they decide to buy any expensive thing in the hospital, they must see how they will get the money back. "*How the money is going to come in yes, how many patients because of that technology, how will it be easier for us to admit a lot of patients?*" because it's from the patients that they get the money yeah. So, it has to go with the demand. Yeah, they don't want to buy a technology that will come and then doesn't profit them in anything, yeah. […] they're not-for-profit! How do they pay their workers? The hospital is not a not-for-profit organization no. Don't patients pay like $5000 to be in the hospital a month? $4000, $3000 yeah. It's not a nonprofit (Technology user 2).

In sum, as mentioned above, principles that guide organizations when selecting project concepts or making any other big decisions are mainly rooted in strategy statement and concern for finances. The strategy statement comprises organizational goals, mission, vision, and values. As to concern for finances, it refers to favoring project concepts or decisions seen as associated with the notions of cost-effectiveness, utility, efficiency, and profitability, based on research or the experience of successful organizations in the same industry (mimetic isomorphism).

5.2.3. Question # 3: Regarding the project front-end context, what are extra organizational factors that shape the project front-end?

Organization's macroenvironment factors have been identified among those shaping project conception and this has applied to my research cases. In this study, project conception was found to be influenced by political, economic, social, technological, environmental, and legal (PESTEL) factors.

According to *Manager 1*, "*externally, the government sometimes provides funding for some initiatives*", and due to implied coercive isomorphism healthcare organizations are likely to favor project ideas that are aligned with government priorities. So, based on this account, political factors shape project conception.

Economic factors also shape project conception and *Technology super user 2* has illustrated this by linking soaring workspace rent with the attractiveness then support of a project conception whose goal was to enable the shift from on-site to cloud computing with Microsoft 365:

> […] you know even just the cost of renting a building like this, right the cost of rent, overhead costs, this is my assumption but maybe you know that is something they factor in you know "*if we can have people work from home this would save us money on some overhead costs.*" I know at one point because of our location the rent was going up here because of what they were building across the street […] (Technology super user 2).

So, financial aspects feature among what matter most to organizations, and this shows the potential of economic factors to influence the conception of digital transformation projects undertaken by healthcare organizations.

Regarding social factors that shape project conception, *Technology super user 1* has mentioned the need to meet business requirements in a regulated industry, and *Technology user 1* the need to consider market trends:

> In healthcare, you're not changing what's not broken. So, you're generally looking for "*do I have to fix something, am I mandated, obligated to do something because something failed and it needs to be replaced or do we have enough, is it difficult in terms of patient safety that we have to put action into place?*" So, sometimes, it's like, it would be an accreditation body that's gonna say "*this is not a safe practice, you need to implement something.*" I find in my area that the trigger is rarely an initiative or somebody that thought about something, it's like mandated by someone, it's either you replace something that's not working anymore, or we are told to do something (Technology super user 1).

> Maybe Zoom has a really good reputation, I mean Zoom was around for many years, I didn't even hear of Zoom but I'm sure IT [people in our IT service] - I know 100% - they would have known about it, they would have looked into it, and they would have made sure everything was good before they said "*yes.*" They would have done that 100%, yes 100% of the time they do that (Technology user 1).

In sum, to achieve their missions, healthcare organizations adopt strategies such as seeking accreditation (normative isomorphism) and acquisition of popular technology, and this

shows the potential of social factors to shape project conception in healthcare digital transformation.

As to how technological factors influence project conception in healthcare digital transformation, *Technology super user 1* has associated the availability of the right technology (suited to the client's needs) in the market and the involvement of the right technology vendor (knowledgeable about the client's organizational culture and workflow) with the quality of this conception:

> I find if you have to deal with external people because you always do, you need a vendor of something you need to purchase. If those are actually not qualified or not involved that makes the project harder. If they don't understand your culture or your workflow and then bring you on a wrong journey and then realize that after, you lose your time, you have to restart from the concept again you have to go back to the drawing board saying "*you didn't listen to what we were telling you or limitations or culture.*" How well the project is going to be accepted? (Technology super user 1).

In short, technological factors also play a role in the conception of healthcare digital transformation projects.

Environmental factors also feature among those that have shaped the (aforementioned) cloud computing project in Organization B. The organization's headquarters were located in a zone which was particularly hit by a severe weather and those concerned with this meteorological condition have supported this project:

The increase in natural disasters sometimes makes it more difficult for clients and staff to come to the building. So, this was the way to have people work from home, continue working despite these issues because where we're located we have gotten some very severe weather that's not hit other parts of the city. Actually we had at one point those microbursts where it's extreme like powerful wind that comes in and we actually had that hit one of our communities, like it really was just a very isolated area and they lost power for three days and this is something that didn't happen across the city, I think you know proximity to the water probably plays a role in that (Technology super user 2).

Still regarding the effect of environmental factors on project conception, *Technology user 3* has linked a project that has allowed their organization to shift from handwritten medical prescriptions to a digital solution to calls for environment-friendly solutions.

So, environmental factors also feature among those having the potential to affect project conception in the context of healthcare digital transformation.

Healthcare organizations have regulations pertaining to privacy and these constitute legal factors that affect project conception in healthcare digital transformation. According to *Manager 1*, their organization follows privacy regulations and the person in charge of privacy matters is part of any managers' committee put in place to screen any project ideas pertaining to digital transformation. In the same vein, *Manager 2* has also related the importance of regulations in healthcare industry by mentioning a certain personal health information protection act (PHIPA) that their organization was obliged to comply with in any undertakings including digital transformation:

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PHIPA, that is, Personal Health Information Protection Act is the privacy legislation that we fall under is very stringent. I don't know if that was, it did come into play in terms of choosing to go to cloud computing, but I know it was definitely something that was considered when we made the decision to go with Microsoft versus something else. I think it's always something that is being considered because the privacy policies that we have to adhere to are so high. Any organization that has health records of any sort, that collects health information has to abide by this legislation. For an organization like ours which is very diverse, it can be a little confusing and it can be a little onerous. For the department that I work in we don't collect health information but because we're under, we work in a health centre we fall under the same legislation. So, it can sometimes be onerous for us when other organizations doing similar work don't have the same requirements (Manager 2).

Based on these accounts, healthcare organizations operate within a framework of specific regulations such as those related to privacy, and this shows the potential of legal factors to shape the conception of digital transformation projects undertaken in healthcare industry.

5.2.4. *Question # 4: Pertaining to the project front-end goal, what form of innovation do selected project concepts reflect?*

Project front-end activities are a creative process, and this research has discovered two (2) forms of innovation, namely, process and business model innovation. Process innovation was realized in both organizations (A and B) as a result of projects that had introduced two (2) types of electronic health records (EHR) (*Manager 1; Technology user 2*), a medication packaging system (MPS) (*Technology super user 1*), a medication order management

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system (MOMS) (*Technology user 3*), and a technology for video-based programming (*Technology user 1*). As to business model innovation, it was achieved by Organization B with its shift from an on-site to a cloud computing modality (*Manager 2; Technology super user 2*).

To sum up, healthcare organizations undertake digital transformations mainly to achieve innovation in process and business model areas.

5.2.5. *Question # 5: Referring to the project front-end goal, what does project success mean to different project stakeholders?*

Regarding the meaning of project success, participants have described it in different words but as a common denominator, the concept was defined as the extent to which one is satisfied with project outcomes with objective indicators:

> To me the project success is very simple. It's three words. The project is done on time, it's on budget, and it meets and satisfies all the scope of the project, that's all the project specifications. So, it's very simple. […]. So, if the project was supposed to go live on August 4 with $500,000 and you were supposed to accomplish a b c d and if you went live on that date within a $500,000 within your budget and you met and satisfied all those specifications and the quality you were supposed to provide done. That's heaven, that's a successful project! (Manager 1).
>
> I would say that it's successful when it's actually part of a new workflow [in case of process innovation] and that the adherence is high, and that people wouldn't be able to live without it anymore. Right like a real success would be how did I live without that before? (Technology super user 1).

If the goal was to increase connections, for example, if we were using this technology to reach more people, more clients, you know that's an easy one, you'd just collect numbers. So, if you had a number goal and you've reached it then that's success. It could also be how many people successfully use all these tools in the department or in the organization and that again could be a percentage of how many people are using certain tools. How you know, it really depends on what your initial goal was when you implemented it, if you met that goal (Technology super user 2). What project success means for me is not just numbers, some people think "the more numbers, the more clients we process, the better we are," okay that's not what it's for me. Project success is "how much are we helping the clients? Is it significant in their life? Are they getting what they need?" Yes, numbers are important, and I deliver my numbers all the time but, it's important that we work with people […] (Technology user 1).

So, the concept of project success refers to one's satisfaction with project outcomes expressed in objective terms.

5.3. SOMMAIRE DU CHAPITRE 5 – *RESEARCH RESULTS*

Cette recherche a généré des résultats qui se résument en cinq thèmes.

Premièrement, l'ignorance de la majorité des répondants à propos de tout ce qui a trait à la phase conceptuelle de projet avec une critique de la gestion de cette phase dû à ce qui était perçu comme un leadership autocratique. D'après ces répondants, la conception des projets était dominée par les plus influents dans l'organisation même s'ils ne comprenaient pas le flux du travail. Deuxièmement, l'importance de stratégie organisationnelle et d'aspects financiers dans la sélection d'un concept de projet. Explicitement, l'attrait d'un concept de projet était principalement associé avec son alignement sur la stratégie organisationnelle et à la faisabilité financière

Troisièmement, la conception de projet comme processus façonné par un contexte multifactoriel. Concrètement, la conception de projet était influencée par les facteurs de toutes sortes, y compris les facteurs politiques, économiques, sociaux, technologiques, environnementaux et légaux (PESTEL). Quatrièmement, la conception de projet comme processus qui vise typiquement l'innovation de procédés et de modèles d'affaires de nature incrémentielle. Sur ce point, les cas étudiés étaient des projets qui avaient aidé les établissements à améliorer les choses dans le domaine de procédés ou celui de modèles d'affaires.

Enfin, le succès de projet considéré comme un phénomène mesurable. À ce sujet, pour lui accorder une certaine tangibilité, quiconque parle de succès d'un projet doit appuyer ses propos avec des indicateurs quantitatifs – exigence d'une complémentarité des méthodes qualitatives et quantitatives dans les organisations.

NEXT CHAPTER - DISCUSSION OF RESEARCH RESULTS

- ABOUT THE PROJECT FRONT-END DESIGN

- ABOUT THE DECISION-MAKING PROCESS IN THE PROJECT FRONT-END

- ABOUT THE PROJECT FRONT-END CONTEXT

- ABOUT THE PROJECT FRONT-END GOAL

- ABOUT THE MEANING OF PROJECT SUCCESS

- SOMMAIRE DU CHAPITRE

CHAPTER 6 - DISCUSSION OF RESEARCH RESULTS

To make sense of their findings, researchers compare their studies with those reported in the literature on the same object of inquiry (Fortin & Gagnon, 2016). So, in this section, I return to my research findings and interpret them in the light of extant knowledge on my research subject matter.

6.1. PROJECT FRONT-END AS A LARGELY UNKNOWN PROJECT PHASE WITH A CHALLENGED LEADERSHIP

Most research participants - almost 90% of interviewees - have shown little knowledge about anything related to the project front-end in addition to being dissatisfied with a very top-down approach to project conception – a leadership style which they blamed for nonacceptance of project deliverables among project intended users. In relation to limited knowledge about anything pertaining to the project front-end, several authors have noted the neglect of project conception compared to the project implementation on the part of researchers and practitioners and called for redress in this area (Morris, 2013, Samset & Volden, 2016). A single participant who knew about the project front-end has described it as a five (5)-stage project phase, a more refined structure compared to the generic structure found in the extant literature on this project phase. As previously mentioned, authors do not agree on the exact number of stages comprised in the project front-end with some advancing two (2) while others mention three (3) stages (Murphy and Kumar, 1997; Samset, 2010; Kerzner, 2013, p. 78; Morris, 2013, p. 164). In relation to a more refined project front-end's structure which has been reported in Organization A, public sector follows a multilayered decision-making process due to its bureaucracy

(Carstensen & Bason, 2012; Lundy & Morin, 2013), therefore, the five (5)-stage project conception found in that organization can be supported by the extent literature on related subjects.

As illustrated in Table 5.2 (or implied), project conception is a collaborative effort with a clear objective, guided by rules and enabled by the use of certain tools and techniques and this is consistent with activity theory, a conceptual lens that analyzes any organized activity in the light of the following seven (7) elements: outcome, object, subject, community, division of labor, tools/instruments and rules (Appendix 1). So, project conception is an organized activity and what happened in my research cases can be explained by activity theory.

Regarding the top-down approach to project conception that was reported by most participants, it is a relatively common phenomenon in which powerful stakeholders dominate the process and get their ideas implemented despite their worthlessness. In this approach, technical analyses are just ceremonial exercises and what matters is the view of the most powerful, whether sudden "gut feel" or long-held political agendas (Murphy & Kumar, 1997; Samset & Volden, 2016). *"No matter how strong professional advice may be for, or against, a project, and whatever the result of extensive use of rational methods, the final decision is a political one"* (Williams et al., 2010, p. 44).

In relation to the nonacceptance of project deliverables that was attributed to a top-down approach to project conception, the literature has linked an autocratic leadership found in such an approach with employee dissatisfaction (Currie, 2012; Goleman, 2000; Van de Ven & Sun, 2011), so, this nonacceptance is understandable. According to Yusuf et al.

(2004, p. 252), the introduction of an enterprise information system in a workplace is an organization-wide change process rather than a mere software installation and to ensure its success, organizations need to adopt an engaging leadership (Lundy & Morin, 2013). Organizational changes require both leadership and project management, the former accounting for 80% of project outcomes and the latter for 20% (Kotter, 1996 cited in Lundy & Morin, 2013) and this explains the negative impact of a coercive leadership on the conception and ultimately project success in HCDT. Still in relation to project resistance in the context of digital transformation, the fear of the unknown has been mentioned among key factors:

> It's less about digital than transformation, and transformation is not welcome anywhere because it's a big change. Nobody wants to change because you are changing ways of working, behaviors, and sometimes territories. Fear is a very important component of our role [Chief Digital Officers' role]. People fear change [...] Change does deliver benefits, but the road to transformation takes work and can be frightening. CDOs [Chief Digital Officers] do not fail because they are unqualified, unmotivated, or incompetent. They fail because they are set up to fail (Digital Adoption Team, 2023).

In short, the association shown by my findings between a top-down approach to project conception and project resistance is consistent with knowledge on leadership styles and their role in employee performance.

6.2. CENTRALITY OF STRATEGY STATEMENT AND CONCERN FOR FINANCES AS LEADING FACTORS IN ORGANIZATIONAL BIG DECISIONS

As mentioned in section 5.1.2, the decision-making process for the selection of project concepts or any other big organizational decisions was based on several principles with the importance of strategy statement and finances as the most important drivers. Pertaining to the importance of strategy statements in organizations, strategy has been described as an instrument that helps or meant to help an organization focus its effort by coordinating a collective action for optimal performance (Mintzberg, 1987, p. 26; Whittington et al., 2020). By analogy, strategy is to an organization is what personality is to an individual (Mintzberg, 1987), so, it was logical for the investigated organizations to align their decisions with their strategy statements, otherwise they risked looking opportunistic.

In relation to the centrality of finances in organizational decisions, Edkins et al. (2013, p. 77) have found finances among key factors behind the selection of project concepts in all kinds of projects. In the same line of thought, private sector organizations generally driven by profitability (Hung et al., 2014, p. 1) while those in the public sector seek efficiency besides efficacy in their service delivery, consistent with the new public management[31] goal (Lapuente & Van de Walle, 2020). So, my findings about the importance of finances in organizational big decisions align with the extant literature on the subject.

Still in relation to organizational big decisions, bad decisions are frequently made due to cognitive biases (Kahneman et al., 2011) but tools such as the behaviorally informed

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[31] Implementation of management ideas from private sector in public sector organizations for the purposes in search for increased efficacy and efficiency in service delivery (Lapuente & Van de Welle, 2020).

decision architecture of a firm (BIDAF) (Sibony et al., 2017) have been proposed to deal with this issue. So, this section also presents two (2) perspectives of research participants on the extent to which their organizations use the BIDAF (Table 6.1).

Research findings BIDAF[32] element	Perspective of a research participant involved in project conception	Perspective of uninvolved participants (in project conception)
Formality (extent to which decisions are based on rules)	+: Decision-making in PFE is a very structured process with specific guidelines including strategy statement	?: No idea about the structure of the decision-making process in PFE but indication of strategy statement as a key lever in this process
Information (degree of reliance on data)	+: Decisions in PFE are data-driven (e.g., based on specific types of data to ascertain the link between a project concept and efficiency)	+: Decisions in PFE are data-driven (e.g., based on specific types of data to ascertain the link between a project concept, and efficiency or profitability)
Layering (involvement of different hierarchical levels in decision-making	+: From the generation of a project idea to the approval of a project conception, the decision-making process comprises five (5) layers	?: Unclear about layers involved prior to project implementation
Participation (consultation with different project stakeholders)	+: Decision-making in PFE is a participatory process	-: Decision-making in PFE is a very top-down process
Debate (exchange of divergent viewpoints)	+: Decisions in PFE result from debate between members of different committees involved in this project phase	-: No debate
Incentives (perverse motives)	-: Decision-making free of any perverse incentives	+: Allusion to perverse incentives in decision-making (TSU 1)
Closure (clarity about the end of the decision-making process)	+: The final decision in PFE activities corresponds with the approval of a project concept by the top management	?: No idea about how PFE activities are concluded

Table 6.1. Use of the BIDAF in research cases

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[32] BIDAF: The behaviorally informed decision architecture of a firm (Sibony et al., 2017)

In summary, my findings on both top principles that guide big decisions in my focal organizations – centrality of strategy statement and finances – are supported by the extant literature on what drives organizational decisions. Regarding the use of a framework for managing cognitive biases in the decision-making process, this framework was being used according to a participant who was often involved in project conception, and this seems consistent with the increasing awareness about this issue.

6.3. PROJECT FRONT-END ACTIVITIES AS A PROCESS UNFOLDING IN A MULTIFACTORIAL CONTEXT

In all research cases, project conception has proved influenceable by a variety of factors in political, economic, social, technological, environmental, and legal (PESTEL) domains. These projects have been conceived in a multifactorial context and this can be explained by theoretical frameworks derived from systems thinking and institutional theory. Systems thinking is an approach to project management viewing projects or any other type of organizations as open systems i.e., sociotechnical entities open to their environments with all kinds of exchanges with other systems therein (Emes & Griffiths, 2018; Kapsali, 2011, Morgan 1998, p. 42; Samset, 2010). As to institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977), its relevance resides in that all institutional isomorphic forces i.e., coercive, mimetic, and normative isomorphism have manifested themselves in my research as they had in other inquiries into healthcare digital transformation projects (Currie, 2012). All these authors point to the potential of macroenvironment factors to influence project conception; therefore, my findings are in line with the literature on my research subject.

6.4. PROJECT FRONT-END ACTIVITIES AS A PROCESS TOWARDS INCREMENTAL INNOVATION IN PROCESS AND BUSINESS MODEL AREAS

"*If it's not broken don't fix it"* goes a popular saying and as expressed by one participant, this principle underlies innovation in public healthcare organizations:

> I find that there's like in healthcare, you're not changing what's not broken. so, you're generally looking for ""*do I have to fix something, am I mandated, obligated to do something because something failed and it needs to be replaced* […] So, *s*ometimes, it's like, it would be an accreditation body that's gonna say "*this is not a safe practice, you need to implement something."* – Technology super user 1

This quote reflects the philosophy which was behind all research cases where projects have enabled incremental innovation in process and business model areas, in 90% and 10% of cases, respectively. Regarding the magnitude of innovation, von Leipzig et al. (2019) have associated radical innovation in digital transformation with high potential for benefits but also with high risk and Ringberg et al. (2019) made the same observation in general context reporting a rate failure of 85% in radical product innovation. Still regarding the magnitude of innovation, public sector organizations have been considered conservative compared to private sector organizations mainly due to their bureaucratic nature and the inherent multi-layered decision-making process whereby ideas tend to be indiscriminately filtered out (Carstensen & Bason, 2012; Lundy & Morin, 2013). Carstensen and Bason (2012, pp. 3,4) view public sector organizations as having a DNA that creates a *perfect storm crushing down on any innovation effort*, a heavy top-down approach to innovation whereby risk

aversion leads to incremental process innovation rather than radical service innovation, eventually making them *anti-innovation machines*:

> Most modern public organization's innovation capabilities are focused on internal administrative processes, rather than on generating new services and improved results for society. New ideas mainly arise from internal 'institutional' sources (mostly public managers themselves, and sometimes their employees), and to a much lesser degree via open collaboration with citizens, businesses, or other external stakeholders. Innovation efforts are typically driven by a few isolated individuals, dependent on their personal initiative and willpower […] Public managers and employees tend to shy away from the edge of something new, sometimes even before they know what it is. Some of it has to do with lack of experience and competence in managing the innovation process. But most of it is cultural: Most public organizations intuitively do not seek to be at the forefront of a change agenda. Risk-taking is typically not embraced, but discouraged (Cartensen & Bason, 2012, pp. 3,4).

To sum up, my work has identified incremental innovation in process and business model areas as the prevailing types of innovation in my research settings and these findings resonate with current knowledge on the innovativeness of public sector organizations.

6.5. PROJECT SUCCESS AS A MEASURABLE PHENOMENON

Regarding the meaning of project success, all research participants have defined project success by referring to the satisfaction of project users with project outcomes in a measurable way and this is largely supported by project management literature on this

subject. Regarding this literature, Samset and Volden (2016) and Wateridge (1998) observe the variation between what project stakeholder groups use as criteria to evaluate projects with project managers focusing on efficiency in project delivery (respect of project budget, schedule, and scope), project users on the usefulness of project deliverables and project sponsors (corporate managers) on long-term project benefits. According to Davis (2018, p. 42) project management research on project stakeholders including the measurement of project performance by project users is in its initial stage, so, finding participants using metrics to evaluate project outcomes like managers in addition to the usefulness of project deliverables seems an unexpected result. However, this consideration of metrics in the definition of project success can be understood in the light of post-positivism, a paradigm that has for so long dominated in both the academic and business worlds (Bohn, 1994; Dumez, 2013, p. 30; Guba & Lincoln, 1994, p. 116):

When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in number, your knowledge is of a meager and unsatisfactory kind: it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the state of science (Lord Kelvin, 1890s cited in Bohn, 1994, p. 74).

So, based on the above, my findings regarding the importance accorded to the use of quantitative indicators in the evaluation of project outcomes are supported by the extant literature.

Due to research limitations, I was not able to get all the investigated projects evaluated by multiple participants and the agreement on the meaning of project success could be just in

principle as people tend to see things differently when it comes to criteria used to judge the outcome of a specific project (Davis, 2018; Liu & Walker, 1998):

> Project success is a topic which is frequently discussed and yet rarely agreed upon. The concept of project success has remained ambiguously defined. It is a concept which can mean so much to so many different people because of varying perceptions and leads to disagreements about whether a project is successful or not (Liu & Walker, 1998, p. 213).

In sum, as reflected in most participants' opinions, metrics matter to project stakeholders when they try to make sense of project outcomes and my findings are supported by the extant literature on project success.

6.6. SOMMAIRE DU CHAPITRE 6 – DISCUSSION OF RESEARCH RESULTS

Par rapport à la dimension de facteurs de conception de projet (DFCP), cette étude a révélé une organisation d'activités en cinq étapes, une organisation plus raffinée que celle trouvée dans la littérature (Gassmann & Schweitzer, 2014, p. 22 ; Morris, 2013, p. 164). Mais d'autres résultats relatifs à DFCP tels que l'association du leadership autocratique et l'insatisfaction des subalternes et l'ignorance de la phase conceptuelle par les gens s'expliquent par la littérature (Goleman, 2000, p. 82 ; Samset & Volden, 2016, p. 298). Toujours en relation avec la DFCP, l'importance de stratégie organisationnelle et d'aspects financiers dans la sélection d'un projet de projet s'explique également par la littérature et ces résultats confirment également ceux des études antérieures (Mintzberg, 1987, p. 28 ; Lapuente & Van de Walle, 2020, p. 462). En lien avec la dimension de contexte de conception de projet, l'influence des facteurs extra-organisationnels sur la conception de projet s'explique par la littérature (DiMaggio & Powell, 1983, p. 147 ; Kapsali, 2011, p. 400). Par rapport à la dimension du but de conception de projet, la dominance de l'innovation incrémentielle sur l'innovation radicale dans les domaines de procédés et de modèles d'affaires et cela s'explique également par la littérature (Ringberg et al. ; 2019, p. 105). Toujours en lien avec la dimension du but de conception de projet, l'importance accordée à l'utilisation d'indicateurs quantitatifs dans la description des phénomènes organisationnels tel que le succès d'un projet et cela s'explique par la littérature (Bohn, 1994, p. 74) ; Dumez, 2013, p. 30 ; Guba & Lincoln, 1994, p. 116).

NEXT CHAPTER - RESEARCH CONTRIBUTIONS

- CONTRIBUTION TO KNOWLEDGE FOR RESEARCH

- CONTRIBUTION TO KNOWLEDGE FOR PRACTICE

- SOMMAIRE DU CHAPITRE

CHAPTER 7 - RESEARCH CONTRIBUTIONS

According to Maylor and Söderlund (2015, p. 13), a doctoral researcher in project management can contribute to knowledge in three ways, namely, enhancing, extending, or adapting theory. Research generates different types of knowledge and to Van de Ven and Johnson (2006), this knowledge falls into two (2) categories, namely, knowledge for theory and knowledge for practice. So, to what have I actually contributed through this research? In relation to different ways to contribute to knowledge, this research has allowed me to enhance project management theory and to extend management and organization theory (MOT) into a particular project context. Relating to the types of knowledge that can be generated by research, this research has allowed me to generate both types of knowledge i.e., knowledge for theory, relevant to the academic world and knowledge for practice, relevant to the professional world.

This chapter focuses on the above contributions and comprises two sections, that is, the contribution to knowledge for theory and the contribution to knowledge for practice.

7.1. CONTRIBUTIONS TO KNOWLEDGE FOR THEORY

As mentioned above, this research has contributed to theory in two ways, by enhancing project management theory and by extending MOTs into a particular project context and this section elaborates on these two modalities. Overall, the theoretical contribution of this research consists in highlighting a symbiotic relationship between project management and MOTs, i.e., a relationship in which project management benefits from using these theories to make sense of project phenomena whereas the same theories use project contexts for

their validation, then extension in these contexts following context and perspective awareness in project management research (Maylor & Söderlund, 2015).

Context awareness in project management research is the cognizance of a project phenomenon as an under-researched subject into which MOTs can extend (Maylor & Söderlund, 2015, p. 14). As aforementioned, this research was motivated by the knowledge gaps that I had identified in the management of the project front-end in healthcare digital transformation and the context awareness in my research consisted of my knowledge about those knowledge gaps.

Regarding perspective awareness in project management research, research in project management requires a conceptual toolbox which contains theories drawn from various disciplines seen as more established than project management - economics, finance, organizational behavior, operations management etc. (Maylor & Söderlund, 2015) – and MOTs fall under this category.

7.1.1. Enhancing project management theory

To some, the literature on project management reflects accepted rather than best practice at best, due to its lack of empirical foundation (Maylor et al., 2008, p. S16; Morris, 2013, p. 233) and as illustrated in Appendix 10, this has negatively impacted the credibility of project management among management disciplines (Morris et al., 2006, p. 711; Young, 2015, p. 23). To address that, several strategies have been proposed including the exploration of project actuality to reveal what really happens in projects (Blomquist et al., 2010; Cicmil et al., 2006; Geraldi & Söderlund, 2016, p. 777), and a broader conceptualization of projects meant to facilitate communication between various entities

given the multidisciplinary nature of projects (Winter et al., 2006, p. 645; Geraldi & Söderlund, 2016).

Pertaining to the exploration of project actuality, this research has revealed the reality of project conception in my research domain such as a more refined project front-end structure compared to what is described in project management literature, limited knowledge about the management of project conception among project stakeholders, the centrality of finances and strategy statement in big organizational decisions, etc. (section 5.1).

Regarding the need for a broader conceptualization of projects, based on this research, the project front-end of healthcare digital transformation can be conceptualized in different ways including the following analogy "The project front-end of healthcare digital transformation as the foundation of a sociotechnical organizational change."

7.1.2. Extending management and organization theory in a project context

Theories develop through various processes including empirical testing and other research methods which show their applicability/relevance to real-world situations (Sanchez & Heene, 2017, Strauss, 1995) and this research has served as a context for theory validation, then extension of the following seven theories:

i) Activity theory

ii) Behavioral decision theory

iii) Governance theory

iv) Institutional theory

v) New public management theory

vi) Post-positivist theory

vii) Systems theory

7.1.2.1. Activity theory

As illustrated in Table 5.2, project conception is a structured process, a collaborative effort with a clear objective, informed by rules and enabled by specific tools and techniques and as such can be effectively investigated with activity theory, a conceptual lens made of the following seven (7) elements: outcome, object, subject, community, division of labor, tools/instruments, and rules (Appendix 1). So, activity theory (Kaptelinin, 2020) features among MOTs relevant to research in project management.

7.1.2.2. Behavioral decision theory

Cognitive biases constitute a common phenomenon in organizations (Kahneman et al., 2011), and as mentioned by one participant (section 5.2.1), sometimes the top management failed to properly target project stakeholders while designating project board members early on in their projects due to their bias toward the powerful even when they were the least knowledgeable about subject matters. So, this example shows the relevance of behavioral decision theory to research in project management.

7.1.2.3. Governance theory

Like corporate governance, project governance is a framework within which project decisions are supposed to be made and stakeholder management to be done (Garland, 2009). As indicated in section 5.2.1, most research participants were dissatisfied with project conception in their organizations citing their exclusion from this process due to what they had seen as a process hijacking by the most powerful. So, governance theory is

also a relevant theory in project management research especially when the inquiry is focused on any matters related to project leadership.

7.1.2.4. Institutional theory

Businesses are shaped by various contextual factors and isomorphic forces feature among the most important (DiMaggio & Powell, 1983). As mentioned by a research participant (section 5.2.2), when their organization is unclear about how to proceed in a particular situation, it looks at its business partners (a coalition of Community Health and Resource Centers) and seeks advice from them, consistent with the concept of mimetic isomorphism. As indicated in section 5.2.3, one organization has approved a project mainly due to its alignment with the priorities of its main funder - a kind of coercive isomorphism at work. Finally, section 5.2.3 presents recommendations from accreditation bodies as a key driver behind the initiation of projects and this illustrates the role of normative isomorphism in shaping project conception in the healthcare industry. In sum, all isomorphic forces operate in project conception, and this shows the relevance of institutional theory to research in project management.

7.1.2.5. New public management theory

According to Lapuente and Van de Walle (2020), the introduction of new public management in the public sector was motivated by the concern for efficiency in addition to efficacy in service delivery and as mentioned in section 5.2.2, the centrality of finances constituted a key driver behind all big organizational decisions. So, new public management theory can also be considered as a relevant conceptual lens for those interested in project management research with a focus on efficiency in the public sector.

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7.1.2.6. Post-positivist theory

Post-positivism assumes the existence of reality, the impossibility of measuring it in an objective way, and the complementarity of quantitative and qualitative methods in inquiries (Guba & Lincoln, 1994). As mentioned by research participants (section 5.2.5), to satisfactorily describe an organizational phenomenon, for example, project success, people need to support their narratives with numbers. So, post-positivist theory is also a conceptual lens relevant to research in project management.

7.1.2.7. Systems theory

Traditionally, organizations are seen as permeable to their environments or open systems (Morgan, 1998) and this applies to projects in their conception as temporary organizations. As indicated in section 5.2.3, project conception is shaped by many factors, and this shows the relevance of systems theory to research in project management.

Research results	Related general theories[33]	Author
Concern for project outcomes	Activity theory	Kaptelinin (2020) McAvinia (2016)
Project conception done in a data-driven and layered process – prevention of cognitive biases	Behavioral decision theory	Kahneman et al. (2011) Sibony et al. (2017)
Autocratic project leadership - project governance	Governance theory	OECD (2004) Whittington et al. (2020)
Complying with funders' directives, meeting the requirements of accreditation bodies, emulating successful business partners - institutional isomorphism	Institutional theory	DiMaggio and Powell (1983) Meyer and Rowan (1977)
Centrality of finances – search for efficiency in business	New public management theory	Alonso et al. (2015) Lapuente and Van de Walle (2020)
Project success as a measurable phenomenon – combination of qualitative and quantitative performance indicators	Post-positivist theory	Dumez (2013) Guba and Lincoln (1994)
Project conception as a process unfolding in a multifactorial context – projects as open systems	Systems theory	Donnadieu and Karsky (2002) Morgan (1998)

Table 7.1. Research results and related general theories

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[33] Management and organization theory (MOT)

7.2. CONTRIBUTIONS TO KNOWLEDGE FOR PRACTICE

As mentioned, this research has revealed the reality of project conception regarding its structure, i.e., stages found in the project front-end, the negative impact of autocratic leadership on project acceptance and the multifactorial nature of the project front-end context. Regarding the structure of the project front-end, project conception was found to be a structured process, and this implies the potential for organizations to benefit from using a stage-gate process when conceiving their projects (Samset, 2010; Kerzner, 2013). Concerning the impact of leadership on project outcomes, research has shown the link between the involvement of project stakeholders and project success, therefore, organizations could improve the success of their projects with participative styles such as transformational leadership (Howell et al., 2005; Whittington et al., 2020).

Finally, regarding the influence of contextual factors on project performance, several authors have seen projects as influenceable by their contexts but also as having the potential to shape these contexts, contexts made of the internal environment (inside their parent organizations) and external environment (outside their parent organizations) (Morris & Geraldi, 2011; Kapsali, 2011). So, based on this conception, organizations have an interest in devising strategies to influence the contexts of their projects.

In short, my findings point to the potential for healthcare organizations to improve the conception of their projects by combining two approaches to project management, namely, a stage-gate process model (Table 7.2) and a model based on an activity system (Table 7.4, Appendix 1) corresponding to an atomistic and a holistic perspective of the project front-end, respectively. This section comprises four parts, that is, i) managing the project front-

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end with a stage-gate process model ii) managing the project front-end with a system activity model, iii) tools and techniques for managing the project front-end, iv) relevance to program management.

7.2.1. Managing the project front-end with a stage-gate process model

As implied by this concept, the stage-gate process is a project management model comprising two main parts, that is, stages defined as groups of activities and gates as structured decision points at the end of each stage (Cooper, 2018; Kerzner, 2013).

What is the purpose of the stage-gate process? Regarding its purpose, the stage-gate process is a mechanism for structured decision-making meant to ensure the quality of project portfolio by weeding out bad projects/project concepts and consequently, a factor of excellence in project management (Cooper, 2008; Kerzner, 2013). Regarding people involved in a stage-gate process, they consist of two categories of project stakeholders, that is, the project core team (PCT) and gatekeepers. The project core team consists of people working on a project on a daily or regular basis, typically, project leader/project manager and project team members. As to gatekeepers, they are people designated by senior management and empowered to evaluate and determine the fate of a project/project concept through a structured decision-making process (Cooper, 2008; Kerzner, 2013).

The stage-gate process constitutes one of various processes used by project management methodology and provides the structure to this methodology through its deployment in different phases of a project life cycle (Kerzner, 2013, p. 77). With respect to the number of gates in a stage-gate process, it depends on the degree of risk associated with a project, i.e., the riskier the project, the more gates needed in a stage-gate process, ideally without

exceeding six gates to prevent the disruption of project work (Kerzner, 2013). As aforementioned, the stage-gate process is a structured process and for this reason, gate reviews use structured artifacts such as ad hoc checklists and forms for the purposes of standardization, objectivity, and transparency in project evaluation (Cooper, 2008, Kerzner, 2013). Regarding the fate of a project/project concept under evaluation, gatekeepers can decide to continue, cancel, hold, or recycle the project (Cooper, 2008).

As with any process, the stage-gate process has got its share of issues, one of them being gates without teeth, i.e., gatekeepers who are afraid to terminate projects which are obviously nonviable (Cooper, 2018; Kerzner, 2013).

> Projects are like express trains, speeding down the track, slowing down at the occasional station [gate], but never stopping until they reach their ultimate destination, the marketplace. In short, the gates have no teeth: once a project is approved, it never gets killed (Cooper, 2008, p. 7).

Stage-gate process concept	Application of the stage-gate process in project conception	Theoretical foundation
• Definition Mechanism for structured decision-making between stages of a project phase	Activity for structured decision-making between stages of a project conceptual phase	Cooper (2008) Kerzner (2013) Morris (2013)
• Purpose Standardization of the process by which project deliverables are evaluated and the fate of a project determined	Objective and transparent evaluation of project ideas and concepts	Cooper (2008) Kerzner (2013) Samset and Volden (2016)
Structure - Project deliverables The object of the evaluation - Criteria for deliverable evaluation Predetermined ad hoc standards on checklists or forms against which to evaluate a project - Outputs Continuing/cancelling/delaying/ revising the project	- Project ideas and concepts - Predetermined criteria on ad hoc checklists or forms such as the organizational fit of a project idea or concept, i.e., its alignment the strategy of an organization and its capabilities - Supporting/rejecting/ requesting further analyses of a project idea or concept	Cooper (2008) Kerzner (2013)
• # of gates Proportionate to project risk but no more than six (6) in any case to minimize project disruption	- Varying number depending on project complexity	Kerzner (2013)
• Parties involved and roles - Project core team (PCT) Project manager and project team members - Gatekeepers Senior people in an organization	- Cross-functional working group - Cross functional managers	Cooper (2008) Kerzner (2013)
• One (1) of top qualities desired in gatekeepers Promptness to kill any project proved nonviable	Consideration of zero option in project conceptual phase., i.e., opting for status quo	Cooper (2008) Kerzner (2013) Samset (2010)

Table 7.2. Application of stage-gate process in project conception (Author)

7.2.2. Managing the project front-end with an activity system model

In project context, success in activity realization is commensurate with the extent to which one asks themselves and finds responses to several questions such as those about who does what, why, with what means, and the collaborative nature of the work (European, C., & Directorate-General for, I., 2021, p. 19). So, based on this observation, organizations including those investigated in this study could benefit from adopting a holistic model for management such as the one based on activity theory and use it in the conception of their projects.

What is activity theory? Activity theory is a conceptual framework focused on seven (7) elements considered as the building blocks of what is called an activity system (Berghaus & Back, 2017; Kaptelinin, 2020; McAvinia, 2016).). Concretely, an activity system comprises the following elements: outcome, object, subject, tools/instruments, rules, community, and division of labor (Berghaus & Back, 2017; Kaptelinin, 2020; McAvinia, 2016).

i) Outcome

In the activity system, the outcome corresponds to the benefit that an individual intends to realize following the achievement of an activity's objective.

ii) Object

In the activity system, the object refers to an objective that an individual wants to achieve.

iii) Subject

In the activity system, the subject is an individual or a group of people who are trying to reach an objective.

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iv) Tools/instruments

Tools/instruments are means that enable a person to reach their objective and include physical tools such as technology and cultural tools such as language and signs. Artifacts such as protocols, guidelines, and standard operating procedures (SOPs) fall under this category.

v) Rules

This element comprises external rules and regulations at the industry level in addition to governance mechanisms internal to the organization. Norms and traditions also fall under this category.

vi) Community

The concept of community refers to the social context in which an activity is realized and other actors – other than the subject – involved in an activity.

vii) Division of labor

In the activity system, the division of labor is the division of tasks between actors involved in an activity and the hierarchical structure of these tasks.

In sum, projects are open systems and organizations could benefit from treating them as such and then combining a focused and a systemic approach to project management, the former concerned with project details and the latter with seeing a project as part of the constellation of systems i.e., an approach interested in a situation's overview (Pollack & Remington, 2016, p. 36).

Activity system concept	Application of activity system to project conception	Theoretical foundation
Outcome	Radical/incremental innovation; product/service/process/business model innovation	Crossan and Apaydin (2010) Ringberg et al. (2019)
Object	A project concept approved following an unbiased decision-making process	Samset and Volden (2016)
Subject	Assigning to project conception the right people i.e., knowledgeable about the issue at hand	Brown et al. (2007) Aubé et al. (2014)
Tools/Instruments	Providing people with the right means to realize their tasks	Patanakul et al. (2010)
Rules	Designing project governance (a set of guidelines for all key project aspects) after a stakeholder/communitarian model of corporate governance[34]	Garland (2009) Whittington et al. (2020) Williams et al. (2010)
Community	Viewing project conception as a community effort, then ensuring the collaboration of all relevant people (e.g., the top management, business partners, customers etc.)	von Leipzig et al. (2017) Woodman et al. (1993)
Division of labor	RAM/RASCI[35] matrix: Assigning tasks to various people based on their skills	Kerzner (2013) European Commission & Directorate-General for Informatics, 2021)

Table 7.3. Activity system model for managing project conception (Author)

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[34]A most inclusive governance model striving to seek and consider input to decision-making from all constituencies affected by a business regardless of their power. Obviously, project governance that was used in research cases reported herein was not based on such a governance model

[35] RAM: Responsibility assignment matrix; RASCI: Responsible-Accountable-Support-Consulted-Informed

7.2.3. Tools and techniques for managing the project front-end

Based on Cooper (1988), Gassmann and Schweitzer (2014), Samset (2010), and my research results, the table below (Table 7.4) shows tools and techniques for PFE in HCDT.

Project front-end stage	Tools/techniques for stages and gates in the project front end	Strategy for managing project front-end	
		Open action strategy[36]	Closed action strategy[37]
Generation of project ideas	-Benefit/cost analysis	x	
	-Brainstorming	x	
	-Brainwriting	x	
	-Business model cards	x	
	-Focus groups	x	
	-Prize competitions for ideas	x	
	-Systems analysis	x	
	-Checklist for benefit/cost ratio		x
	-Scoring models		x
Assessment of project concepts	-Financial reward/risk analysis	x	
	-Profitability/utility appraisal	x	
	-Project logical framework	x	
	-Proof of concept	x	
	-SWOT analysis	x	
	-Uncertainty mapping	x	
	-Project strategy and strategic frame requirements		x
	-SBAR		x
	-Checklist for organizational fit		x
	-Scoring models		x
Definition of project concepts	-Collecting *user stories*	x	
	-Eliciting feedback on the presented concept	x	
	-Creating *delivery stories*		x
	-Prototyping		x
	-Checklist for profitability/utility		x
	-Scoring models		x
	-BIDAF		x

Table 7.4. Tools and techniques for managing the project front-end

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[36] Strategy for encouraging creativity
[37] Strategy for process control

Legend

☐ : Tools and techniques for activities in project front-end stages

▊ : Tools and techniques for the first gate review "Screening of a project idea"

▊ : Tools and techniques for the second gate review "Evaluation of a project concept"
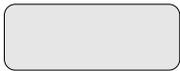
▊ : Tools and techniques for the third gate review "Selection of a project concept"

7.2.4. Relevance to program management

What is program management and how does it relate to project conception? Program management is a mechanism by which a collection of interconnected projects and non-project work with a common objective are managed in a coordinated way that enables an organization to extract benefits that would otherwise remain unrealized (Maylor et al., 2006, p. 670; Miterev et al., 2016; Pellegrinelli, 2007, pp. 41, 42). Compared to a project, a program is more centered on value creation and the realization of benefits expected from a project. So, whereas projects typically close out when a product of service has been handed out to a user, a program is supposed to keep running until the benefits from the product or service have been realized (Maylor et al., 2006, p. 670).

As discussed in previous sections, the creation of value by a project starts with the selection of a right project concept, therefore, the project conception and program management can be seen as two opposing extremes of a process meant to generate benefits for an organization. In addition to the common focus on value creation or benefits, project conception and program management share other characteristics such as the determining role of political considerations when making big decisions, the importance of stakeholder engagement, and the permeability of a managerial process to its environment.

The *determining role of political considerations* when making big decisions refers to the fact that political considerations prevail over technical analyses when making big decisions. In relation to project conception, this research has discovered the generation of project concepts that were destined for project implementation by the top management without input from subordinates. In program management, the prioritization of projects when selecting the portfolios of projects for programs is mainly shaped by the top management and this testifies to the importance of political considerations in program management (Pellegrinelli et al., 2007, p. 48; Miterev et al., 2016, p. 553).

Regarding *stakeholder engagement*, it relates to the imperative for those managing project conception and programs to secure buy-in from key stakeholders, a success factor in both project conception, as it has been discovered by this research, and program management (Pellegrinelli et al., 2007, p. 46; Miterev et al., 2016, p. 554).

Finally, pertaining to the *permeability of a managerial process to its environment,* this research has discovered a mutual shaping of project conception and its environment, and

the same phenomenon has been observed in the relationship between program management and its environment (Pellegrinelli et al., 2007, pp. 49, 52; Miterev et al., 2016, p. 553). In conclusion, project conception and program management have several similarities, and to a certain extent, program management could be informed by the results of this research.

7.3. SOMMAIRE DU CHAPITRE 7 – *RESEARCH CONTRIBUTION*S

La pertinence d'une recherche réside dans son potentiel d'avancer les connaissances sur deux plans, les plans théorique et professionnel (Van de Ven & Johnson, 2006) et cette étude a contribué à ces deux types de connaissances. À l'échelle disciplinaire, la recherche en gestion de projet peut avancer les connaissances de trois manières - en raffinant les théories, en étendant leur domaine d'application ou en les adaptant aux contextes spécifiques (Maylor & Söderlund, 2015, p. 13). La contribution de cette étude correspond aux deux premières modalités.

Sur le plan théorique, la pertinence de cette étude réside dans deux choses. D'abord, la contribution à la maturité de gestion de projet grâce à la révélation concernant la réalité de gestion de conception des projets de transformation numérique dans un domaine spécifique qu'est le secteur public de soins de santé. Cette révélation consiste en différentes choses, entre autres, la structure de la phase conceptuelle de ces projets. Toujours sur le plan théorique, la contribution de cette étude consiste en illustration d'une relation symbiotique entre la gestion de projet et les théories générales de management et des organisations. Dans cette relation, la recherche en gestion de projet mobilise ces théories tandis que ces dernières utilisent les projets comme contextes de leur validation.

Sur le plan professionnel, cette étude propose un modèle de gestion de la conception de projet censé améliorer ce processus par une combinaison de contrôle du projet (évaluation formelle à la fin de chaque étape du projet) (Cooper, 2018, Kerzner, 2013) et une perspective holistique de l'activité (Berghaus & Back, 2017 ; Kaptelinin, 2020).

NEXT CHAPTER - CONCLUSIONS

- KEY TAKEAWAYS FROM RESEARCH

- RESEARCH SIGNIFICANCE

- RESEARCH LIMITATIONS

- DIRECTIONS FOR FUTURE RESEARCH

CHAPTER 8 - CONCLUSIONS

Have I achieved my research goal? If yes, do my findings have any relevance in a broad sense? And, finally, what about limitations and directions for future research? Based on my results, this research has achieved its goal, and this chapter presents the essence of these results along with research significance, limitations, implications, and directions for future research.

8.1. KEY TAKEAWAYS FROM RESEARCH

Regarding the design of project conception i.e., its set-up, it was largely unknown to most research participants and this process was in general poorly rated due to what was perceived as autocratic leadership by project intended users. As mentioned by participants, it is one thing to have an information system, but quite another to have it used by the intended users. So, as a managerial implication, organizations need to ensure a participatory process that involves all key stakeholders during the entire project life cycle, and this brings to the forefront the role of project governance as an oversight function in project management.

As to the context of project conception, it has been described as multifactorial with all kinds of factors shaping this process and organizations could benefit from using systems thinking in this project phase. Concerning the goal of project conception as a creative process, it mainly consists of incremental innovation in process and business model areas and organizations could promote innovation by institutionalizing mechanisms such as an interactionist model of organizational creativity, a framework for creativity as a phenomenon that involves three levels – individual, team and top management.

8.2. RESEARCH SIGNIFICANCE

To a certain extent and cautiously, research findings from a qualitative study can be generalized to settings different to that in the study has been conducted. So, in a broad sense, the findings of my research could be relevant to both researchers and organizations interested in phenomena like the one that I have investigated and operating in similar settings. Explicitly, my research was focused on the concept of digital transformation - a type of large-scale organizational change – in public healthcare organizations, entities known for their bureaucracy. Based on these characteristics, the insights from my research could be relevant and transferable to similar research settings with the potential to inform both researchers and practitioners interested in studying or managing similar processes i.e., major organizational changes in hierarchical organizations and this is consistent with the concept of analytic generalization. According to Yin (2016, p. 333), analytic generalization is a manner of generalizing the findings of a study to other settings that have not been investigated based on a variety of processes including logical arguments. The transferability of my research findings is based on a logical argument developed around bureaucracy as a distinctive feature of public sector organizations.

8.3. RESEARCH LIMITATIONS

Virtually, every research has limitations and those found in this work resulted from two (2) factors, namely, one related to project design and another related to project context. In relation to the factor related to project design, this project has benefited from the guidance of my supervisory team but overall, it was conceived as solo research and implemented as

such rather than a team-based inquiry. "*A way of seeing is a way of not seeing*"[38], goes a

saying consistent with a postmodernist worldview[39], and this truth could apply to research

such as this that was based on a single perspective. Explicitly, compared to case studies

conducted by one investigator, those realized by multiple investigators yield more reliable

results[40], so, the solo approach to research conduct could have negatively affected the

quality of my project thus contributing to the limitation of my research.

Concerning the factor related to the project context, as with any projects, doctoral projects

have been described as political processes often opposed by various parties found in their

environments[41] and mine was not an exception to the rule. So, I got used to what I may call

"*The politics of a doctoral journey*" i.e., a phenomenon in which I would invite research

participants, then hear all kinds of obscure reasons for their non-participation, an unhelpful

attitude which has delayed my project.

Besides politics, another factor in the environment of my project that could have impacted

it negatively was the timing of its empirical phase. This phase started in early 2022, the

time when COVID-19 pandemic was making headlines as a root cause for business

disruption in various industries including healthcare. According to various media, this

industry was dealing with a variety of challenges including human resources that were

stretched out but to me the role played by those challenges in derailing my project was

negligible compared to politics.

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[38] Van de Ven (1989, p. 487)
[39] Johnson and Duberley (2000, p. 99)
[40] Eisenhardt (1989)
[41] Laufer and Gorup (2019, p. 165)

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So, how have all these problems affected my research? Compared to its initial design, this study has relied on fewer organizations and research participants with less diversified profiles, and this might negatively impact its credibility. However, it may still have some relevance given its nature – an exploratory study – and measures[42] that were taken to mitigate this threat.

8.4. DIRECTIONS FOR FUTURE RESEARCH

To wind up, there is room for more studies on my research subject and additional insights could be generated in two (2) different ways – from a process and a variance-focused approach[43] and for illustrative purposes, I use a medication order management system described in section 5.2.1.

A process-focused approach could seek opinions on how this system has been conceived from three project stakeholder groups: i) people in managerial positions given their accountability for organizational performance ii) IT people for their technical expertise, and iii) technology intended users. The inquiry could explore the link between project leadership during project conception and the satisfaction of project stakeholders with project conception.

Concerning the variance-focused approach, a survey could be conducted to link the project leadership style that was used during project conception (exogenous variable) and service quality (endogenous variable).

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[42] Data triangulation
[43] Orlikowski and Scott (2008, p. 438)

APPENDICES

- APPENDIX 1 - ACTIVITY SYSTEM

- APPENDIX 2 - DATA TRIANGULATION

- APPENDIX 3 - INTERVIEW PROTOCOL

- APPENDIX 4 - MATERIALS FOR PARTICIPANT RECRUITMENT

- APPENDIX 5 - PROJECT HARDNESS/SOFTNESS DICHOTOMY

- APPENDIX 6 - PROJECT LIFE CYCLE

- APPENDIX 7 - RESEARCH DESIGN MAP

- APPENDIX 8 - RESEARCH ETHICS APPROVAL

- APPENDIX 9 - RESEARCH INFORMED CONSENT FORM

- APPENDIX 10 - STATUS OF PROJECT MANAGEMENT IN MANAGEMENT FIELD

Activity system (Kaptelinin (2020)

APPENDIX 2 - DATA TRIANGULATION

2.1. Data triangulation through document analysis

Research case	Interview's content	Source and documentary evidence
Medication packaging system project (research case # 1)	Technology super user 1: In many cases, project ideas come from an accreditation body	Organization's website: The website's homepage shows the logo of the accreditation body
Acute care electronic health record (EHR) project (research case # 2)	- Manager 1: […] with a few other hospitals you know in Ottawa, [X, Y, Z etc.] to name a few, we [six hospitals] all went live in 2017 with the MEDITECH system. So, we shared electronic patient records and it's all built based on access, roles, and privileges and so on

- Manager 1: Our organization has its goals published on our external website but, they are usually about the quality of care of our patients, innovation, and learning | - Websites of partnering hospitals (project partners): Information about system exploitation and names of partnering hospitals

- Organization A's website: The organization's website shows different kinds of information including its mission, vision, and goals |
| Long-term care electronic health record (EHR) project (research case # 3) | Technology user 2: This EHR has reduced medical errors | Organization's e-newsletter – January 2016: Our LTC EHR increases safety and effectiveness in care |
| Long-term care electronic health record (EHR) project (research case # 3) | Manager 1: Selection of a project concept based on facts i.e., the findings of a working group documented in a SBAR form | -Project manager's presentation at the project implementation kick-off meeting in March 2015: the selection of the system was based on its popularity it was the most used in Canada and from a leading |

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		vendor in Canada and the United States -March 2015 project governance: Evaluation of options are based on facts
Medication order management system (MOMS) project (research case # 4)	Technology user 3: In 2021, [X] hospital integrated this prescription module into [Y] – an EHR used in acute health care	December 2017 e-magazine focused on Canadian healthcare technology: Recently, several hospitals including [X] went live with [Y]
Cloud computing project (research case # 5)	Manager 2: Our organization was growing quite rapidly over the last 10 years or so okay and we were outgrowing our physical space, and we also had a lot of different locations we were already having different parts of the organization at different locations	Organization's website: Indication of organization's multiple locations
Video-based programming project (research case # 6)	Technology user 1: There is a community building there that the (X) Public Health has taken over so if it wasn't for Zoom, I would have no programs in that community	COVID-19 Pandemic: Community Needs Assessment Report - Summer 2020: The Health Promotion team has hosted and participated in virtual community meetings with residents and stakeholders […] and offering residents virtual programming in order to reduce social isolation and promote wellbeing. Organization's 2021-2022 annual report: In the second year of the global pandemic, our Health Promoters continued to innovate and pivot their outreach and

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		programming to meet the emerging needs […] through the hybrid service delivery model

To verify the credibility of accounts in my data, I have used two (2) strategies, namely, comparison of participants' accounts on the same subject, and validation of participants' narratives by secondary data.

2.2. Data triangulation through comparison of participants' narratives

Regarding the combination of interviews, *Manager 1,* and *Technology super user 1* have agreed on the importance for the selection of project concepts or any other big decisions to align with the organization's strategic goals:

At [Organization A] and almost any organization that we work with [project conception] is very structured, there are committees who make these decisions. So, [here] at [Organization A], there is a senior strategy team who make all these big decisions about any transformation. So, an idea can emerge from the bottom of the organization but then it needs to go to the top, when it gets to the top, they're gonna ask all those complicated questions right, they're gonna ask okay, you know, "*what is the objective, right?*" So, they typically during this phase do a lot of focus groups and workflow assessment. In a hospital culture, you talk about okay "*what is your current workflow? What is your desired workflow? What is your objective?*" So, typically, when the hospital or the leadership tries to do this assessment, they try to understand the objective of that. The other thing they try to do is to see if the objective aligns with the organization's strategic goals, mission, and vision. Not

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every idea turns into a project so, the alignment of the project objective with [Organization A]'s mission and goals is mandatory, it's a must and [Organization A] has its goals published on our external website but, they are usually about the quality of care of our patients, innovation, and learning, 3 top priorities for Organization A (Manager 1).

I think it always comes from strategic planning like they have a review of those strategic goals in terms of like "*what are we perceiving our organization to be at a certain time*? So, where do we want to invest our energy?" So, I think that's where the selection of the projects is going to come from. If we're saying it's not within our values or within our strategic goals, then it's not gonna be something we gonna embrace. [...] "*What is your strategic pyramid?*" [Organization A] has certain values they want to fulfill: leadership, education, compassion, etc. "*So, how are we going to support them through our project, making sure that those are fulfilled?*" So, if we're saying we want to be an educational institution so, "*what do we put in place in terms of strategy to make sure that we have students [who are] well treated and have nice rotations? So, do we need support digitally? So, do we have to have a personal device strategy or things like that?*" So, I'm seeing that more from their strategic goals and they [top management] share that with their employees (Technology super user 1).

Still regarding the comparison of participants' narratives about the same subject, *Manager 2,* and *Technology super user 2* from [Organization B] agree on the top-down nature of project conception in their organization:

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No, I don't think so, not really, it [the project conception] was very much top-down, it was very much "*this is what we're doing*," and it was just implemented. There was very little design discussion, at least from what I could see. I think there must have been some amongst the IT team and maybe our corporate services, but it wasn't anything that was apparent? To me as a manager (Manager 2).

I think there were some discussions during all staff meetings and emails, but I don't remember anything else. I feel like the discussion was one side with little opportunity for employees to share their input. The communication was around selling the product instead of open dialogue. It felt like "*this is what we are using moving forward so get used to it.*" (Technology super user 2).

2.3. Data triangulation through the comparison of participants' narratives and physical artifacts

Concerning the role of accreditation bodies in driving organizational change in the healthcare industry:

I find that there's like in healthcare *"you're not changing what's not broken."* So, you're generally looking for *"do I have to fix something, am I mandated, obligated to do something because something failed and it needs to be replaced* […] So, *s*ometimes, it's like, it would be an accreditation body that's gonna say, "*This is not a safe practice, you need to implement something."* (Technology super user 1).

In relation to this need for accreditation, I have been at one of Organization A's campuses and found a banner with the name of the healthcare accreditation body at the entrance. So, this narrative has also been validated.

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As to what could have motivated Organization B to shift from the on-site to cloud computing:

> I do feel that we had some input, I think the issue came down to the fact that we would have staff who were at different satellite locations who never came to the site here [our headquarters], they didn't have access to the shared files that we had because you had to be at [Organization B] to access them right, you have to be, I guess, on the network. I think they saw that there was this need to make it more universal more accessible […] I know one thing that was discussed was that there was a real disconnect with people who worked in satellite locations versus the main site, they felt like there was almost like a workplace culture here and it was separate from other locations. So, I could definitely see that as a way to better connect everyone to everyone, to have better access as a whole and I think this has been in the talks for a long time the fact that satellite locations don't feel like a part of the whole sometimes because they're not on site they're not experiencing that (Technology super user 2)

In relation to this narrative, prior to the interview, I already knew where the headquarters of Organization B were located as well as the locations of its two (2) satellite services. So, this account was also validated by physical artifacts.

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1. Interview background

1. 1. Research title

Exploring the management of the project front-end of healthcare digital transformation – a design, context, and goal perspectives

1. 2. Research goal

This project is exploratory research aimed at discovering the actuality of the project front-end/project conception of healthcare digital transformation with focus on 3 main dimensions of any project i.e., project design, project context and project goal

- The *project design* dimension refers to all that is related to factors considered as internal to a project and its parent organization, and therefore designable i.e., <u>influenceable to a certain extent by a project</u>

- The *project context* dimension consists of factors external to a project's parent organization, i.e., macro environmental factors that shape a business and which are <u>not directly influenceable by a project</u>

- The *project goal* dimension comprises 2 subdimensions, that is, <u>adding value to a business</u> <u>directly</u> (G1), and <u>enabling the adaptability of an organization to its environment</u> (G2). These are achieved through the following 4 forms of innovation: product and service innovation for G1; process and business model innovation for G2

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1. 3. Defining key concepts

- Digital transformation

A major organizational change i.e., experienced in the entire organization or department (service/program) following the introduction of information systems/digital technologies in a business and aimed at achieving innovation in a product, service, process, or business model area

- Project front-end

Also called project conception, the project front-end is a project phase concerned with ideation i.e., the generation of a rough project idea and its translation into a project concept (a technically feasible project idea) destined for project implementation.

2. Interview

2. 1. Interview opening

- About myself

- About my research subject and the motivation of its choice

- Motivating the choice of X as a setting for this research

- Contribution expected from this research

- Any questions/comments from the participant

2. 2. Interview questions

- Asking the participant to introduce themselves with focus on their education, and professional experience

- Stating the interview purpose and participant's latitude to skip questions

- Proceeding with questions

1. *From a <u>project design</u> perspective,*

   i) What is the process by which Technology X - a particular information system/digital technology that has been introduced in your organization - has been put in place i.e., how ideas have been generated then translated into this technology?

   ii) How do you rate this process, why such a rating and if you see room for improvement in it, could you tell me about this?

   iii) What tools and techniques were used/ were available for use in this process, to which extent were they used, how do you rate them and why such rating?

   iv) In relation to tool usability, what are 3 top features/characteristics that make/would make a technology attractive/user-friendly?

   v) The approval of a project concept (a technically feasible project idea) in the context of digital transformation is a big decision due to its strategic implications ($, workplace dynamics, etc.). So, could you tell me about any principles that your organization has followed while approving the project concept behind Technology X? What is the rationale behind these principles?

2. *From a <u>project context</u> perspective, could you tell me about extra-organizational factors that have influenced the conception of Technology X?*

3. *From a <u>project goal</u> perspective, based on your perception of Technology X, what kind of innovation was your organization seeking to achieve in the conception of this technology?*

4. *Lived experience with organizational change varies among those affected by this type of process. So, <u>how has the rollout of Technology X affected your work</u>?*

5. *In relation to the link between project conception and project outcomes, people tend to not agree on what project success signifies. To you, <u>what does this (project success) mean</u> in the context of healthcare digital transformation?*

2. 3. Interview closing

APPENDIX 4 - MATERIALS FOR PARTICIPANT RECRUITMENT

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1. Project title

Exploring the management of the project front-end in healthcare digital transformation – a project design, context, and goal perspectives

2. Digital transformation and its purpose

Digital transformation is a major organizational change enabled by the introduction of digital technologies in a business and aimed at improving performance through innovation in product, service, process, or business model area.

3. Research context

Partial requirement of Doctor of Business Administration (DBA) – project management program

4. Researcher

Jean-Bosco Ntakirutimana, Université du Québec en Outaouais (UQO)

5. Research supervision

Supervisor: Hamed Motaghi, PhD, UQO

Co-supervisor: Dragos Vieru, PhD, TÉLUQ University

6. Research goal

To discover the reality of project conception in the context of healthcare digital transformation i.e., how organizations actually generate and translate ideas into viable solutions when they intend to introduce digital technologies in their businesses.

7. Kinds of needed participants

3 categories of participants who would consent to share their lived experience with digital transformation.

7.1. Managers

People in managerial positions who have been involved in the conception of digital transformation projects.

7.2. Project core team members

People who have been involved in digital transformation projects on a daily/regular basis.

7.3. Technology end users

People who have witnessed the introduction of digital technologies in their services/programs (administration, clinical services, community-oriented programs, etc.).

8. Role of research participant

To share their experience with the conception of digital transformation projects in their service/program

o Interview modality: Videoconference or phone call

o A 45 to 60-minute interview focused on questions sent in advance

o Interview language: English or French

Consent to participation in research is to be signed by the participant before the interview.

9. Research ethics

This research has been approved by the research ethics board of Université du Québec en

Outaouais as Project # 2021-1547

Interested in participating?

Contact Jean-Bosco Ntakirutimana: ntaj06@uqo.ca; █████████

Participate in Research on digital transformation at X

Project title: Exploring the management of project front-end in healthcare digital transformation – a project design, context, and goal perspectives
Researcher: Jean-Bosco Ntakirutimana, UQO
Research Supervisor: Hamed Motaghi, PhD, UQO
Research Co-supervisor: Dragos Vieru, PhD, TÉLUQ

Research question

How do healthcare organizations manage the conceptual phase of their digital transformation projects?

Eligibility criteria

Having been involved in at least 2 digital transformation projects in healthcare industry either as *i)* a unit manager, *ii)* a project core team member or *iii)* a technology end user, either at X , or in other organizations

Research participant role

To participate in a ¾ to 1-hour interview through videoconference

Interested in this study?

Please contact the researcher: Jean-Bosco Ntakirutimana
Phone: X
Email address: X

This study has been reviewed and approved by:

Research Ethics Board of X
Email address: X

Participe à la recherche sur la transformation numérique à X

Titre du projet: Exploring the management of project front-end in healthcare digital transformation – a project design, context, and goal perspectives
Chercheur: Jean-Bosco Ntakirutimana, UQO
Directeur de recherche: Hamed Motaghi, PhD, UQO
Co-directeur de recherche: Dragos Vieru, PhD, TÉLUQ

Question de recherche

Comment les établissements de soins de santé gèrent-ils la phase conceptuelle de leurs projets de transformation numérique?

Critères d'inclusion

Expérience dans au moins 2 projets de transformation numérique dans l'industrie de soins de santé soit, en tant que *i)* gestionnaire d'une unité, *ii)* membre d'équipe de projet ou iii) utilisateur(trice) de technologies numériques, à X ou aillleurs

Rôle du(de la) répondant(e)

Participer à une entrevue de ¾ à 1 heure par videoconference

Cette étude vous intéresse?

Veuillez contacter le chercheur: Jean-Bosco Ntakirutimana
Tél. : X
Adresse courriel : X

**La présente étude a été revue et approuvée par :**

Le bureau d'éthique de la recherche de X
Adresse courriel: X

APPENDIX 5 – PROJECT HARDNESS/SOFTNESS DICHOTOMY
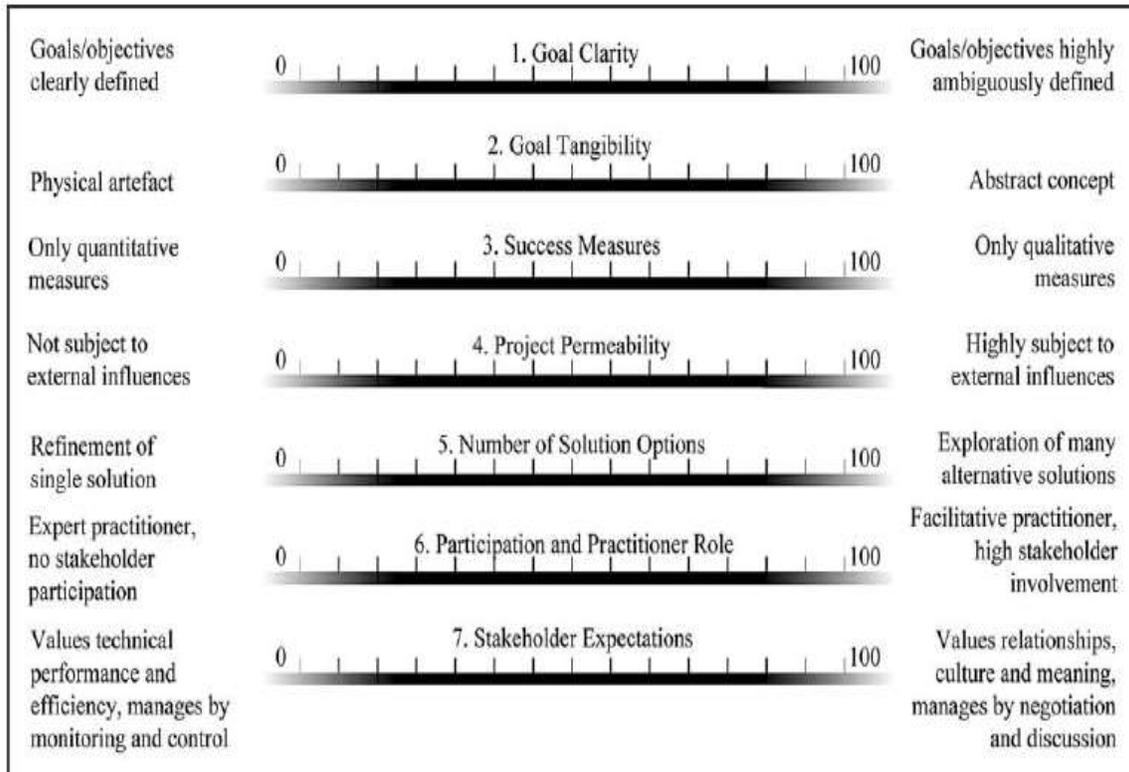
Project hardness/softness dichotomy (Crawford & Pollack, 2004, p. 650)

APPENDIX 6 - PROJECT LIFE CYCLE FROM A STRATEGIC PERSPECTIVE
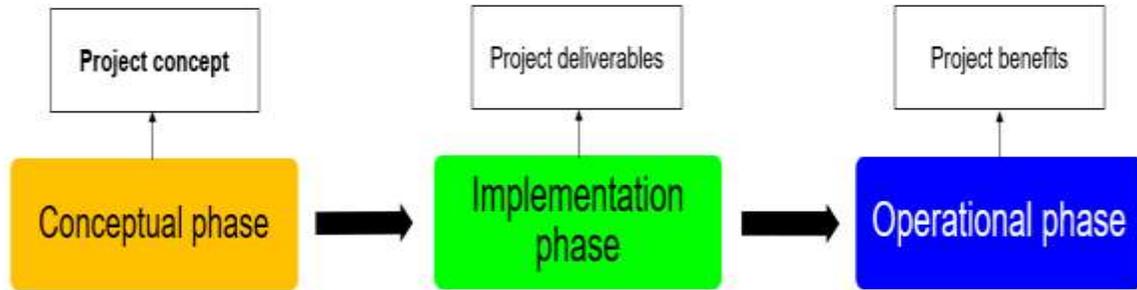
Project life cycle from a strategic[44] perspective (Author after Samset, 2010, P. 29)

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[44] The strategic perspective of a project life cycle is broader than the tactical perspective. The former focuses on "*doing the right things*" i.e., ensuring project benefits from the identification of a good project concept first, then proper project execution. As to the latter, it is just concerned with "*doing things right*" i.e., seeking efficiency in project execution.
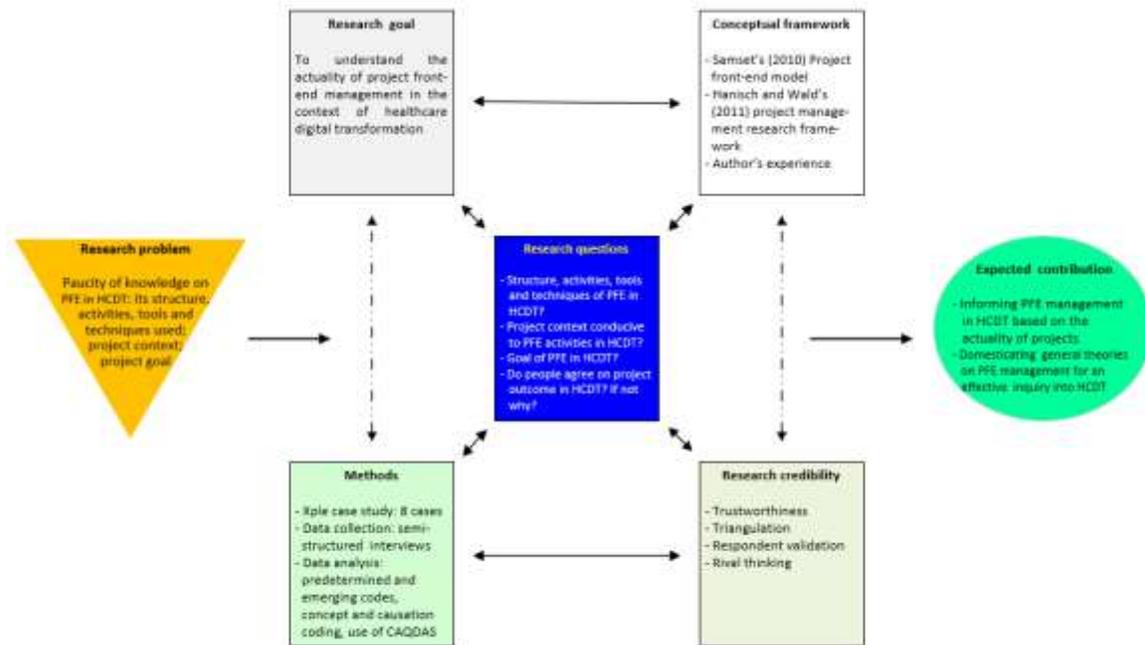
PFE: Project front-end; HCDT: Healthcare digital transformation; CAQDAS: Computer-assisted qualitative data analysis software

Research design map (adapted from Maxwell, 2013)

Research design map[45]

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[45] This research design map was created in November 2021, then it evolved afterwards for pragmatic reasons (details provided in section 8.3)

APPENDIX 8 - RESEARCH ETHICS APPROVAL

UQO

CERTIFICAT D'APPROBATION ÉTHIQUE

La présente atteste que le projet de recherche décrit ci-dessous a fait l'objet d'une évaluation en matière d'éthique de la recherche avec des êtres humains et qu'il satisfait aux exigences de notre politique en cette matière.

Projet # : 2021-1547

Titre du projet de recherche : EXPLORING THE MANAGEMENT OF PROJECT FRONT-END IN HEALTHCARE DIGITAL TRANSFORMATION - A DESIGN, CONTEXT, AND GOAL PERSPECTIVES

Chercheur principal :
Jean Bosco Ntakirutimana
Étudiant, Université du Québec en Outaouais

Directeur de recherche :
Hamed Motaghi
Professeur, Université du Québec en Outaouais

Date d'approbation du projet : 10 janvier 2022

Date d'entrée en vigueur du certificat : 10 janvier 2022

Date d'échéance du certificat : 10 janvier 2023

Caroline Tardif
Attachée d'administration, CÉR
pour André Durivage, Président du CÉR

NAGANO Approbation du projet par le comité d'éthique - 3
www.nanano.ca Comité d'éthique de la recherche - UQO

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APPENDIX 9 - RESEARCH INFORMED CONSENT FORM

Project title: *Exploring the management of project front-end in healthcare digital transformation – a design, context, and goal perspectives*

Research ethics: This research has been approved by the research ethics board of

Université du Québec en Outaouais (Project # 2021-1547)

Name and researchers' contacts

Researcher: Jean-Bosco Ntakirutimana, ████████, ntaj06@uqo.ca

Supervisor: Hamed Motaghi, PhD, hamed.motaghi@uqo.ca

Co-Supervisor: Dragos Vieru, PhD, Dragos.Vieru@teluq.ca

Invitation

Based on your potential to contribute to our research project, we are, hereby, inviting you to participate in it. The information in this form aims to help you understand what we are asking of you so that you can decide whether you agree to participate in this study. Your participation is entirely voluntary, and you are entirely free to participate or not, and to withdraw at any time without prejudice.

Research purpose

This study consists in exploring the management of project conception in the context of healthcare digital transformation and will help us gain insights into different areas including:

- The main activities realized in this phase and their organization

- The tools and techniques used in these activities

- The conducive context for the realization of these activities

- The goals pursued by organizations when undertaking digital transformation

Research participant role

As a research participant, you will be requested to share your experience and knowledge on project conception in healthcare digital transformation by participating in a 45 to 60-minute interview through videoconference or phone call. This interview will be recorded for transcription purposes. Should the researcher need more clarification on your part, he could conduct a follow-up interview.

Risks and Benefits

Theoretically, there is no risk associated with your participation in this project. As to expected project benefits, the results of this research will help practitioners and researchers better understand the reality of project conceptual phase in digital transformation, a phase known for its impact on project outcomes.

Incentives for participation in research

No monetary compensation will be provided for your contribution to this research project. So, you agree to participate in this project on a voluntary basis. You will receive just a token of appreciation.

No waiver of your rights

By signing this form, you are not waiving any rights or releasing the researchers from any liability.

Withdrawing from the study

You are entirely free to participate or not in this research project and you can withdraw from it at any time without having to motivate your decision. If you withdraw your consent during the study, all the information collected from you before your withdrawal will be discarded. After the study, you may request that your data be removed from the study and deleted by notice given to the Principal Investigator (named above) within one month of the interview.

Confidentiality

To ensure confidentiality in research, we will remove all identifying information from the interview within 24 hours of data collection. We will treat your personal information as confidential, although absolute privacy cannot be guaranteed. Research records identifying you may be accessed by authorized staff of Université du Quebec en Outaouais for the purpose of research monitoring.

The results of this study may be published or presented at an academic conference or meeting, but the data will be presented in such a way that it will not be possible to identify any participants unless you give your express consent. De-identified data from this study

may be shared with other researchers for verification, and to permit them to build upon our findings.

You will be assigned a code (or pseudonym) so that your identity will not be directly associated with the data you have provided. All data, including coded information, will be kept in a password-protected (or encrypted) file on a secure computer. We will encrypt (or password protect) any research data that we store or transfer.

Data Retention

After the study is completed, your de-identified data and video recordings will be retained for a period of five years and then securely destroyed.

New information during the study

If any changes could affect your decision to continue participating in this study, you will be promptly informed.

Ethics review

This research project has been approved by the research ethics board of Université du Québec en Outaouais. If you have any ethical concerns about the study, or the way it is conducted, please contact this board by email or telephone: comite.ethique@uqo.ca, 819 595-3900 Ext. 3909

Statement of consent – print and sign name

I, _____, have read the information given in this informed consent and all my questions have been answered to my satisfaction. I have had sufficient time to consider whether to participate in this study. I understand that my participation in this study is

voluntary and that I may withdraw from the study at any time without risking any prejudice

or having to motivate my decision.

I voluntarily agree to participate in this study.

I would like you to send me a summary of results from this study when they are available.

Yes __ No ___

Email:

I agree to be video recorded   Yes __ No __

Signature of participant   Date:

To the best of my knowledge, the information in this consent form, and the information

that I, Jean-Bosco Ntakirutimana, have provided in response to any questions, fairly

represents the project. I am committed to conducting this study in compliance with all the

ethical standards that apply to projects that involve human subjects. I will ensure that the

subject receives a copy of this consent form.

Jean-Bosco Ntakirutimana

APPENDIX 10 - PROJECT MANAGEMENT STATUS IN MANAGEMENT FIELD

Project management conception	Author
• **PM as a mature academic discipline** Project management *is "not a crossroads discipline"*, which would mean diluting its content and making it a "receptacle" or depository of what is produced elsewhere, in other academic disciplines. [It] exists in and for itself, with its own corpus of knowledge, concepts, organizations, methodologies and lines of thinking (Garel, 2013, p. 664)	• Garel (2013, p. 664); Turner et al. (2013, p. 5); Young (2015, p. 21)
• **PM as a semi-discipline/profession,** a discipline/profession in emergence or just a knowledge domain due to its atheoretical nature both conceptually and empirically • **PM as an emerging discipline** in business management domain • **PM as just a practice**	• Morris et al. (2006, p. 711); Morris (2013, p. 233); Maylor and Söderlund (2015, p. 14) • Maylor et al. (2008, p. S16) • Maylor et al. (2008, p. S16); Kerzner (2013, p. 66)

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