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INTEGRATING ADAPTIVE REUSE OPERATIONS ON DEFUNCTIONALIZED HISTORIC CAMPUSES

ENABLING FULLY SUSTAINABLE TRANSFORMATIONS
THROUGH CAMPUS MANAGEMENT THEORIES



front and back cover illustrations:

Osservanza Psychiatric Hospital "general view from the kitchen" and "general view from the baths"
- Fotografia U. Tamburini (Imola)

INTEGRATING ADAPTIVE REUSE OPERATIONS ON DEFUNCTIONALIZED HISTORIC CAMPUSES

THE CREM/PREM DAS FRAMEWORK AS AN ENABLER OF
FULLY SUSTAINABLE CROSS-DOMAIN REQUALIFICATION PROJECTS

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DEDICATION

During these last years in Delft I have had the pleasure, the joy and the honor of being surrounded by people, near and far, who have made this work possible, and who have made of my stay a journey that I will bring inside me for the rest of my life. To all of them I wish to address my words in the prelude to my Master Thesis.

First of all, to my mother and father, who have always loved and supported me unconditionally from Italy, and whose efforts have made all of this possible, meaningful and beautiful. To Paolo, without whom I would not be here in Delft, and without whom I would not consider the last four years the best time of my life. To Emanuele, Erik, Gustaf and Kevin, for having made me live what having a brother feels like and for having been always by my side. To Tugba, for having always believed in me and for having walked me closer to a better myself. To Edoardo, Laura, Lorenzo and Michele, for having shown me with their words, thoughts and actions the beauty of true friendship. To Anna, Ana and Saskia, for what will always mean to me to have shared with you this journey and all the many things we shared. To Marjo, Marte, Rianne and Sophie, for having been my family far from my family. To Margherita and Francesca, for having made a home of my house. To Aniek, for having seen what's good in me, and without which I would not know how many colors the world actually has. To my mentors, for having believed in me as a student and as a person, for having challenged me and for having taught me how to dare, try and be proud of my accomplishments. To Delft and the Netherlands, for having welcomed me and having given me possibilities that I would not have had elsewhere.

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(...) The human stroked the cat's back. "Well, cat, we did it," he said, sighing.

Zorba seemed to reflect for a moment. "Yes. At the edge of the void she understood the most important thing of all," Zorba said.

"Oh yes? And what was that?" the human asked.

"That only those who dare may fly." (...)

from *The Story of a Seagull and the Cat Who Taught her to Fly*
by Luis Sepúlveda (4th October 1949 - 16th April 2020)

ABSTRACT

The Age of Enlightenment in the Western World countries brought to the establishment of several private and public healthcare, military, justice, educational and research-related organizations straddling the 19th and the 20th centuries. Characterized by unprecedented levels of organizational complexity and presenting similar internal dynamics, they developed a common type of architectural portfolio which adequately responded to their specific intra-operational requirements: the campus. While enabling their organizations' operational and physical progress, the also allowed them to adapting with times, supporting processes of adaptive reuse transformation following the institutions' recursive managerial cycles. Eventually, these mechanics could not respond to the radical reforms which concerned these organizations since the second half of the 20th century, which instated a diffuse phenomenon of dismissal of their historic campuses. In such circumstances, additionally, several factors as the large physical scale of the complexes, their heritage status, the disruption of the management processes and the lack of alternative intervention methods caused the depletion of present and prospective stakeholders' interests. This hindered the possible the adaptive reuse operations from precluding their full sustainability up to preventing them, instating processes of abandon, demolition, degradation or degeneration and entailing the steady loss of their architectural, urban, functional, economic, historic and socio-cultural values.

In the perspective of re-enabling, promoting and fostering fully-sustainable adaptive reuse transformations of the heritage to avoid the value losses, this research recognizes the lack of integration between the intervention domains participating in adaptive reuse operations as the main cause of the phenomenon. Specifically, it points to the impossibility for organizations to inform, support and assess such cross-domain broad-spectrum transformations

following the serial structure of current adaptive reuse operational models. Once observed the specific managerial, entrepreneurial and architectural characters of such transformations, the research focuses on the analysis of their processes and procedures in order to define the extents up to which they can be integrated and synchronized. The three intervention domains are interpreted through the recursive DAS framework (CREM/PREM theories), the linear DCE framework (entrepreneurial venturing theories) and the linear DFH framework (architectural heritage intervention theories). Within these frameworks, the research highlights a common internal processes organization consisting of five procedural phases (analysis – interpretation – elaboration – execution – assessment) grouped in three operational phases (pre-/per-/post-operations). These phases are successively used to synchronize the intervention pipelines by matching and integrating the processes of each of the three domains belonging to the same procedural and operational phases. This results in a parallelly-structured operational model in which the coherent processes of the three intervention domains are executed synchronously throughout the identified procedural and operational phases. These phases are then consolidated by defining the conduction tools available to the process managers (and to the ones of each individual domain), the nature and the relevance of the information transfer among the processes within a same procedural phase and/or the previous/next one and finally the reciprocal contributions of each domains in respect to the others. Additional importance is given to the effect of these elements on the dynamics between the managerial and extra-managerial domains.

The research then focuses on the theoretical validation of the proposed alternative operational model for adaptive reuse transformation of defunctionalized historic campuses. This is carried out by means of comparison with the current available ones and by assessing on the performance improvement that each of its domains (individually), operational phases (transversally) and involved stakeholders (globally and per domain) prospectively enjoy. Specifically, the comparative analysis reveals an increased ability of adaptive reuse operations conducted through the integrated operational model to consistently address the interests of the involved stakeholders and to be backed by major support networks. Nonetheless, it allows their proactive participation and the establishment of mutually beneficial relationships by allowing ground for collaboration and cocreation. Additionally, it shows their higher aptitude in managing the risks inherently related to the operations by allowing its incremental phasing, which provides an otherwise absent degree of tolerance for ambiguity and proofs them from the excessive hindrance represented by intrinsic and extrinsic transformation factors. The integrated operational model also prompts to more fully sustainable transformations thanks to the coexistence of the control processes pertaining to each intervention domain. Furthermore, it fosters the proposition and the successful completion of the transformations by reenabling the managerial information, support and assessment role of the organizations and reinserting them in their real estate management continuum. Overall, the proposed model better allows to restore, preserve and enhance the architectural, urban, functional, economic, historic and socio-cultural values of the dismissed historic campuses rather than the current ones. To achieve these performance increases, however, it relies on the presence of a favorable stakeholder environment at the local, regional and possibly national scale, whose involvement in the entire transformation process requires their availability for greater time and effort investments. Due to these requirements, the inclusion in the intervention program of elements such as a flagship project-orientation, the reliance on triple, quadruple and quintuple helix

innovation models and the constitution of public-private partnerships should be strongly considered to facilitate the transformation process.

Keywords: *campus, campus management, campus development, architectural heritage transformation, adaptive reuse entrepreneurship, transformation viability, value, full sustainability, operational model, integration, real estate performance, process and project management.*

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1 INTRODUCTION

1.1 CREM/PREM theories, the DAS framework and the campus

Corporate and Public Real Estate Management (CREM/PREM) theories have the objective of improving the performance which corporate/public real estate portfolios provide to their organizations and their stakeholders (de Vries 2007; den Heijer 2008; 2011, 92,100,104). Their cyclical nature makes them particularly suitable to be employed throughout the entirety of portfolio-related management and intervention operations, from the analysis to the assessment. In these regards, their implementation in iterative frameworks like the Designing Accommodation Strategies (DAS) allows to recognize the discrete procedural units and sub-units in each of the cycles of the Real Estate Management (REM) continuum (de Jonge et al. 2007; 2009; van der Zwart, van der Voordt, and Arkesteijn 2009). This currently makes DAS-framed CREM/PREM theories a reference management tool for organizations whose operations heavily rely on the constant compliance between their portfolios and their needs, describing and consequentially enabling to recognize and control the sequence of decision-making moments of the REM.

The enactment of the DAS framework by corporate and public organizations was historically possible because their pre-existent portfolios natively supported constant review and update processes. This specific design criterion was introduced at the end of the 19th century by western-world public and private institutions reformed after the precepts of the Age of Enlightenment, operating in sectors such as higher education, research, technology, healthcare, military and justice. These institutions developed portfolios that specifically combined functional separation, organizational flexibility and physical proximity to be

able to accommodate their unprecedented complexity and to allow room to perfect with time their organizational structure. Their portfolios consisted of architectural complexes (made of several independent and/or adjoined buildings equipped with a certain degree of organizational autonomy) enclosed in parks at the border of their cities. For enjoying a broad consensus up to being inflected into many purpose-specific variations, the common design mainlines of these facilities eventually consolidated into a proper architectural type, currently known as campus – from the latin “*campus*”: the physical place where one (or more) coherent activities take place.

1.2 From campus-enabled dynamics to campus management

The campus physical configuration greatly increased the performance of the organizations by whom it was adopted by facilitating their operational dynamics, but also confronted them with more complex and frequent REM processes. This necessity spontaneously led them to investigate into portfolio-specific REM protocols and schemes, which progressively evolved into CREM/PREM theories and frameworks. Since then, organizations de facto developed an extensive toolset of proper campus management theories by complementing the two physical (campus) and managerial (DAS-CREM/PREM) apparatuses (van der Zwart, van der Voordt, and Arkesteijn 2009; den Heijer 2011, 109, 115; Arkesteijn 2016). Through the DAS, campus management introduced future-proofing criteria that allowed the facilities to respond to the mutating necessities of their organizations at an increasingly faster reconfiguration pace and with improved efficacy. Through introducing CREM/PREM perspectives (strategic, functional, financial and physical) in the portfolio management processes, it enhanced the organizations’ understanding and governance of their strongly interdependent network of stakeholders. Eventually, campus management theories determined for the institutions the possibility to keep on operating in their original facilities throughout the diverse historical periods of their lifespan up to the present.

1.3 Adaptive reuse transformation as extraordinary campus development operations

The benefits brought by campus management were not limited to ordinary operational conditions: they also encompassed some extraordinary events that considerably affected both the facilities and their organizations. Most notably, campus management resulted essential in more recent times to respond to the increase in the complexity of portfolio management operations such as the one following the heritage enlistment of most of these architectural complexes. These events entailed the introduction in the REM operations of transformation-specific protocols belonging to extra-managerial intervention domains (like the enforcement of preservation, restoration or repurposing regulations for architectural heritage interventions). The nature of such inclusions required recurring to appropriate intervention methods able to successively accommodate these processes while relying on the REM processes, often represented by adaptive reuse transformations. Through their implementation, the CREM/PREM theories on which campus management is based allowed organizations to maintain a direct supervision on the independent

processes inherent to the introduced domains (such as the heritage one), while informing, supporting and assessing them once they reached their completion (de Jonge 1997; Krumm 1999). Additionally, this allowed their recursive structure to frame and incorporate the processes from the same domains into the REM continuum through adapting the campus management cycles into dedicated project management processes, ultimately preserving the managerial continuity (Arkesteijn 2016).

While campus management enabled to perform such complex multi-domain portfolio operations in functional facilities, it could not be as effective for complexes that were defunctionalized following radical institution-related events (such as organizational reforms, dismantlement or changes in their nature and/or paradigm). Two notable characteristics inherent to this situation caused this performance inhibition. On one hand the lack of a new function and of an organization able to conduct the necessary adaptive reuse operations. This called for the inclusion of additional processes from the entrepreneurial domain to identify possible repurposing directions and to instate a new organization to strategically, financially and functionally support the necessary physical transformations. On the other the much larger scale and spectrum of the interventions, whose greater resource requirements (financially, temporally, physically, organizationally etc.) changed them into unique linear one-shot operations (Rittel and Webber 1973). Not only these operations result inherently hard to frame into cyclically structured REM operations, but they are also highly dependent from the external boundary conditions (at an intra-organizational level) as well as intrinsically subject to political inferences (at an extra/super-organizational level) (Rittel and Webber 1973; Bachrach and Baratz 1963). The concurrence of these characteristics (and of their direct and indirect consequences) critically hindered the capacity of campus management to foster, inform, sustain, and assess the adaptive reuse interventions. Nonetheless it broke the REM continuity before and after the campuses' requalification creating a gap correspondently to the intervention execution. Because of the consequent impossibility of accounting for the different interests at stake, these factors additionally sunk the support that such transformations enjoyed from existing and prospective stakeholders, up to even discouraging external third-party initiatives.

The elevated difficulty of successfully instating the constituent processes of adaptive reuse in dismissed or defunctionalized campuses initiated the progressive loss of their architectural, urban, functional, economic, historic and socio-cultural values. This process affected the scenario transversally, regardless of the specific cases. In fact, while not-reused campuses steadily began losing values due to abandon or degradation, the ones that could be - to different extents - repurposed were mainly transformed at the expenses of one or more of the CREM/PREM perspectives and of their related stakeholders, losing value following their demolition or degeneration.

1.3.1 The case of Italian former psychiatric hospitals

The situation of western world mental healthcare facilities clearly shows the phenomena of value losses concerning dismissed campuses. These processes started once they were declared organizationally and functionally outdated following a profound change of the psychiatric paradigm in the 1950s (Campanini, Guarino, and Lippi 2005; Ajroldi et al. 2013). From a facility-based system in which the campus-like psychiatric hospitals were

the prime therapeutic apparatuses, the reform turned about towards new socially integrated and community-based therapies. This shift was performed by steadily defunctionalizing complexes through the introduction of a long-term diffuse process of planned obsolescence. While this shift is still ongoing in most countries, Italy forcefully completed it by dismissing its psychiatric hospitals between 1978 and 1996 (Repubblica Italiana 1978a; 1978b; 1993; 1995). A focus on the Italian scenario evidently shows how several among the previously listed factors critically restrained the interests of present and prospective stakeholders in the requalification of the psychiatric facilities during (and following) the four-decades long dismissal process. Some were relatable to the one-shot character of such operations, like the prolonged politically and financially unfavourable conditions, the large scale of the interventions and the great resources investments required (Rittel and Webber 1973). Some others came from the complexity of the required interventions, like the absence of a clear repurposing direction and the impossibility for the healthcare public authorities (as real estate owners and administrators) to instate alternative functions. These conditions summed up to the pre-existing complications represented by the heritage enlistment of the campuses (Repubblica Italiana 2004) and by the inherent managerial complexity of coordinating and integrating the domains into coherent adaptive reuse interventions. As a result, installed healthcare authorities as well as external third-party organizations were discouraged from proposing and fostering consistent real estate transformation processes (Zanzottera 2013). Therefore, the entire Italian public-held portfolio of defunctionalized former psychiatric hospitals (consisting of more than seventy facilities with average extensions of 14ha and gross floor areas of 2ha) was mostly left in abandon and steadily converged into the grand total of urban voids of the country. Only a few among the dismissed facilities underwent transformation processes. Other than the specific significant complexes for which it had already been decided their conversion into public psychiatric museums and archives (Raimondo 2013), the remainder of the interventions was carried out in a speculative and/or unsustainable way. In fact, exploiting the absence of an organization capable to manage complex adaptive reuse operations, the interventions were mostly pushed by a specific stakeholder at the expenses of a comprehensive consideration of the CREM/PREM perspectives and of the other stakeholders' interests. Subsequently to the development of abandon and degeneration dynamics, the dismissed campuses started suffering relevant losses in terms of architectural, urban, functional, economic, historic and socio-cultural values, to date still diffusely occurring (Ajroldi et al. 2013; Lenza 2013; Zanzottera 2013)

1.3.2 The wider extents of the phenomenon

Albeit already relevant for its nation-wide extension, the Italian phenomenon acquires an even more significant tale-telling connotation for its architectural type in the wider frames of its historical moment and geographical distribution. Through these lenses, the apparently isolated case originated by specific circumstances becomes the glaring signal of an increasing trend with broader extents. A first wider outlook at the panorama that includes the other western-world countries shows a general absence of policies, programs or methodologies to sustainably allow the steady dismissal of a growing number of psychiatric facilities (Bowis 2006). Not even the complexes in countries that facilitate adaptive reuse are exempt from value losses, being often transformed by allowing their demolition, their full privatization or their degeneration through untenable conversions (County Asylums

2019; Asylum Project 2019). A second enlargement of the perspective that encompasses not only former psychiatric facilities, but also other historical campuses reveals that several other entities (like military barracks and penitentiaries) are concerned by dismissal processes due to radical organizational changes. The occurrence of this phenomenon in similar conditions, through comparable dynamics and with analogous results, eventually reveals the inherently systemic and general characters of a problem that transcends the specificity of the individual cases in which it can be observed. Additionally, it warns about the probability of the ever-increasing development trend of the phenomenon.

1.4 Observations on the current situation

The contextual analysis of the panorama of defunctionalized historic campuses revealed a diffuse and apparently unavoidable loss of their architectural, urban, functional, economic, historic and socio-cultural values. The loss occurs regardless private and/or public organizations' efforts to adaptively reuse the dismissed facilities. The contextual analysis also identified two main causes at the origins of this phenomenon. The first cause is the additional operational complexity of such large-scale, broad-spectrum and cross-domain interventions. The second cause is the one-shot character that the transformations acquires because of the processes involved by the extra-managerial domains.

The observation of the problem from an organizational perspective, reveals that the operational cross-domain complexity and the linear one-shot character of adaptive reuse transformations impede their correct framing into the cyclical structure of recursive REM processes. The enactment of such operations generally interrupts the managerial continuum in their correspondence, eventually restraining the REM to correctly inform, support and assess the processes of the other domains involved in the interventions. The lack of control on the operations and the disregard of the CREM/PREM perspectives in the decision-making moments of the transformations critically hampers the interests of existing and prospective stakeholders', which don't endorse the interventions nor their proposals. These circumstances mostly prevent the realization of adaptive reuse transformations and preclude the full sustainability of the few ones carried out, instating phenomena of abandon and degradation (in the first case) or degeneration and demolition (in the second case) since the early dismissal phase of the portfolios. Eventually, these processes cause the value losses suffered by enlisted defunctionalized campuses (fig. 1).

The combination of the outcomes of the conducted analyses allows to gain valuable insights on the problem within its context and to draw significant considerations for the definition of a valid approach to deal with the loss of values concerning enlisted defunctionalized campuses. In a first place, it reveals that the problem has a stratified nature and is rooted throughout different levels of adaptive reuse operations, all linked through cause-effect relations and contributing to the loss of values in a direct and/or indirect way (fig. 1). Because of this, the research for a solution to the problem should fully cover the elements in each of the affected levels until the uppermost, instead of focusing exclusively on the ones directly connected to the loss of values. In a second place, though, it excludes from this argument the two causes at the very origin of this phenomenon. As they constitute the operational conditions of the adaptive reuse transformations in analysis, they

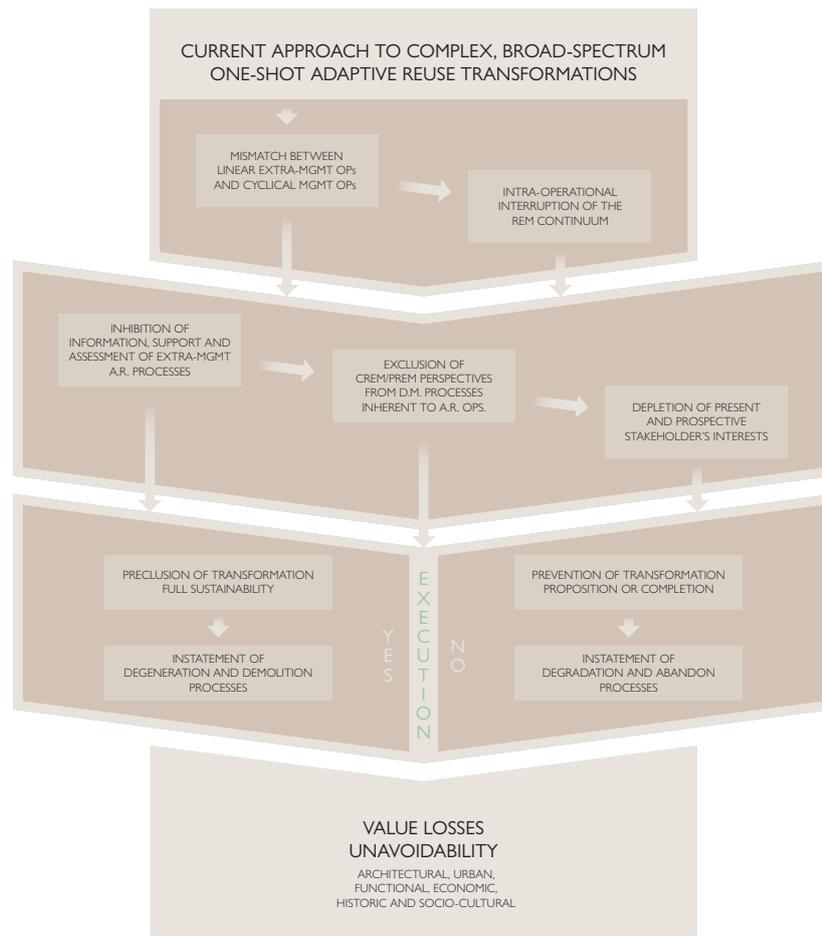


Fig. 1:
The relations between the elements that contribute to the occurrence of the loss of values concurrently with the adaptive reuse transformation of defunctionalized enlisted campuses.

fall of the competence and control of the management domain (and of any other domain involved in the interventions). This confirms the previously supposed impossibility of completely resolving the problem, prompting to research on its attenuation or to counterbalance it instead. Additionally, it circumscribes the research to dynamics inherent to adaptive reuse operations. In a third place, it exposes the specific unique characteristics that each of the cases presents always due to the one-shot character of the transformations and to their operational cross-domain complexity, leading to switch the research from the definition of a systemic approach valid for all the cases towards a more adequate methodology of enactment of the adaptive reuse interventions. In a fourth place, the combination of the research outcomes identifies the loss of values as the result of the instatement of two specific processes: the abandon and degradation of the facilities (caused by the prevention of adaptive reuse transformations execution) and their degeneration and demolition (caused by the preclusion of the full sustainability of the interventions). These processes take place following the missing implementation of the adaptive reuse operations in the REM continuum, which interrupts the management processes during adaptive reuse transformations. However, the analyses also show that this interruption does not take place for adaptive reuse interventions carried out on still functional campuses, which consequentially do not incur in significant value-losses. In these situations, campus management successfully introduces the adaptive reuse operations in the managerial continuum without substantially perturbing it. This integration is due to the native capability and flexibility of campus management theories and frameworks to spontaneously adapt to accommodate the processes of the other domains involved in the operations, informing, supporting and assessing them to sufficient extents. This leads to consider that the corollary to the operational complexity and to the one-shot nature of transformation of defunctionalized campuses could far exceed the threshold by which campus management can spontaneously adapt and deliver its expected performance, ultimately resulting in the impossibility of employing campus management theories and frameworks “as-is” in broader-extents transformations.

1.5 The position of this research within the current situation

Within the hypothesis that the cross-domain operational complexity and the one-shot nature of adaptive reuse interventions on defunctionalized historical campuses inhibit the integration between the management domain and the other domains involved in the transformations, the insights gained through the analysis enable to more clearly define how to proceed in order to contrast the observed loss of values (fig. 2). Specifically, they acknowledge the impossibility of completely eradicating the problem (as intrinsic to this type of transformations) and prompt towards an alternative organization of the processes within adaptive reuse transformations. This alternative organization should possibly address the flawed internal elements of adaptive reuse operation through trickle-down dynamics, factually inverting the fashion by which they occur in current transformations. Precisely, it would first allow to integrate – and not just insert - the different domains involved in adaptive reuse operations into the cyclicity of campus management frameworks, ensuring the REM continuum intra-operationally. This would then provide the opportunity of integrating the campus management processes and the extra-managerial adaptive reuse operations, re-enabling their correct information, support and assessment.

The resulting inclusion of the CREM/PREM perspectives in the decision-making processes inherent to the operations would lead to a greater consideration and valorization of the interests of present and prospective stakeholders. The additional support that the latter would consequently provide to the transformations, summed up to the instatement of the beforementioned dynamics, would eventually foster the proposition and execution of the adaptive reuse transformations and better uphold them, hence ensuring their full sustainability. Finally, this would contribute to the reduction of the processes determining the value-losses, up to possibly opening to preserve and potentially enhance the architectural, urban, functional, economic, historic and socio-cultural values of defunctionalized enlisted campuses through adaptive reuse transformations (fig. 3).

Research objectives

To verify the proposed thesis, this research aims to determine (A) how can campus management theories be successfully employed to foster and support broad-spectrum adaptive reuse transformations of defunctionalized campus-like historic architectural complexes in order to contrast their loss of values. To this purpose, the research will address the critical points exposed by the conducted analyses. Specifically, it first investigates on (B1) how to match the domains involved in these adaptive reuse transformations to allow the REM processes throughout the whole execution of the operations. Secondly, it explores on (B2) how to integrate the campus management processes in these adaptive reuse operations to allow them to correctly inform, support and assess the processes of the other intervention domains. Thirdly, it examines (B3) how can campus management successfully introduce these adaptive reuse operations in the REM continuum without interrupting it.

Research method

The wide and comprehensive theoretical background necessary to research within the disciplines underlying the initial hypothesis in combination makes it incredibly difficult to answer to the posed research question (a) with a direct approach. However, the identification of its and consequential elements (see fig. 2) allow the subdivision of the observed problem into sub-problems that more easily allow to be directly dealt with. For this reason, the research will focus on the resolution of their related sub-questions through qualitative methods. Once defined these answers and delimited the research extents, the elements and the dynamics behind each of them are analyzed individually and in conjunction, and eventually recomposed in reason of the initial problem statement in order to answer to the main research question (fig. 3). For this purpose, the research considers the campus management continuum through the perspectives exclusively inherent to adaptive reuse transformations rather than to the wider set of portfolio management operations. Furthermore, it considers the direct involvement of public stakeholders in the adaptive reuse operations, as their participation (by different extents) is generally required by the legislation frameworks concerning the enlistment of the campuses taken into consideration in these specific circumstances. Ultimately, it considers its elements (comprehensively intended, such as information, aspects, subjects, actors, variables, parameters, decisions, dynamics etc.) in groups/categories when possible, with the objective of facilitating the qualitative approach. This is however done respecting their specific traits, always avoiding simplification and generalization if possible. Rather than to heavily rework each individual

aspect in detail, in fact, this research aims to define a process/project management tool able to coordinate the entirety of adaptive reuse operations.

Research structure

In reason of what as of now illustrated, the research first clarifies the theoretical framework within which it operates and the knowledge background to which it refers in chapter 2. Chapter 3 analyzes the modalities by which adaptive reuse operations are inserted in the campus management development continuum. Then, it then investigates the current structure of adaptive reuse operations and of the extra-managerial domains necessary for the requalification of enlisted campuses. Successively, it explores in detail the sequence of processes within the operations and determines the relations between it and the problems and sub-problems previously identified within the hypothesis. On them are then proposed the characteristics and structure necessary for viable alternative adaptive reuse interventions to revert the dynamics provoking the loss of values and other phenomena to it causally or consequentially related. In chapter 4, this proposition is further developed through the definition of the steps necessary to set-up such integrated adaptive reuse structure. Following the three sub-problems and their related sub questions, is first searched the alignment criterion among the adaptive reuse intervention domain. Once identified, the operations are consolidated with campus management in the perspective of incorporating its tasks and perspective and of reconnecting the REM continuum. Finally, chapter 5 illustrates the specification of the defined alternative, including the details on its dynamics, processes, timings, parameters, variables, information, support and assessment. It also reports the toolset available for the coordination and control of the operation and for their coherent and integrated execution. Additionally, it assesses and verifies the answers provided by so-configured adaptive reuse operations to the research question and to the sub-questions, surveying the response to the observed problem. This is carried out in terms of full sustainability of the operations, of their chance of succeeding and in terms of values preservation, restoration and/or enhancement. Chapter 6, 7 and 8 respectively report the conclusions to the research, the reflections on its effectiveness, limits, and correspondence with the intended results and the recommendations for its employment, expansion, update and eventual application to other cases and fields.

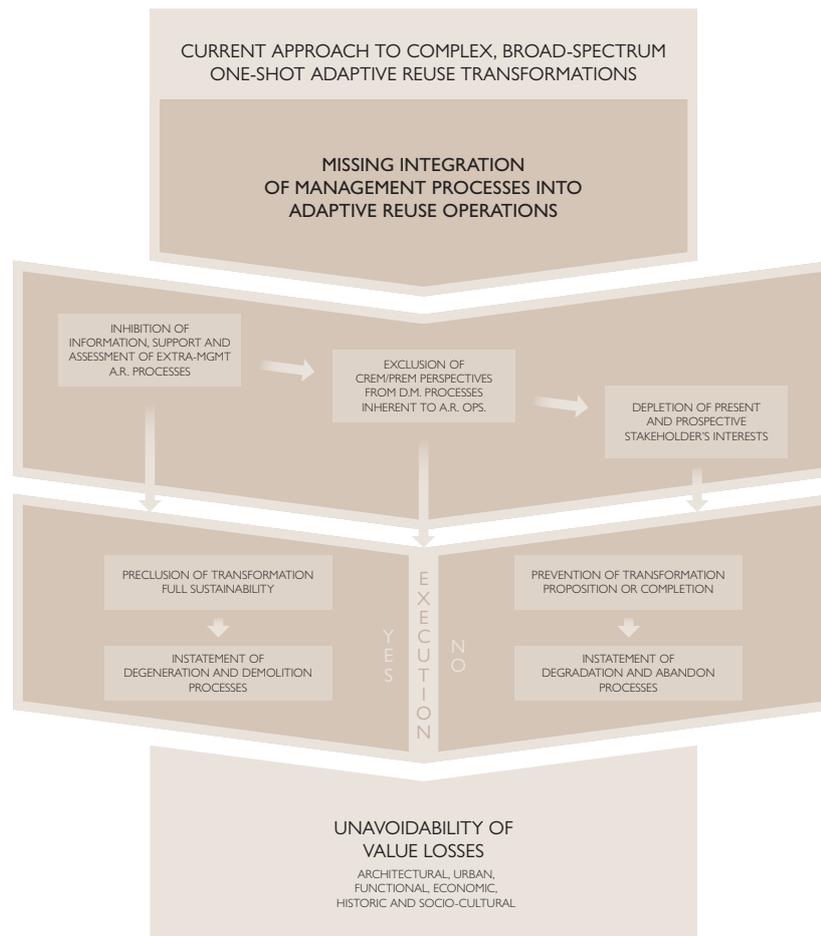


Fig. 2:
The impact of the missing integration between the management domain and the other intervention domains on the value loss caused by adaptive reuse transformations.

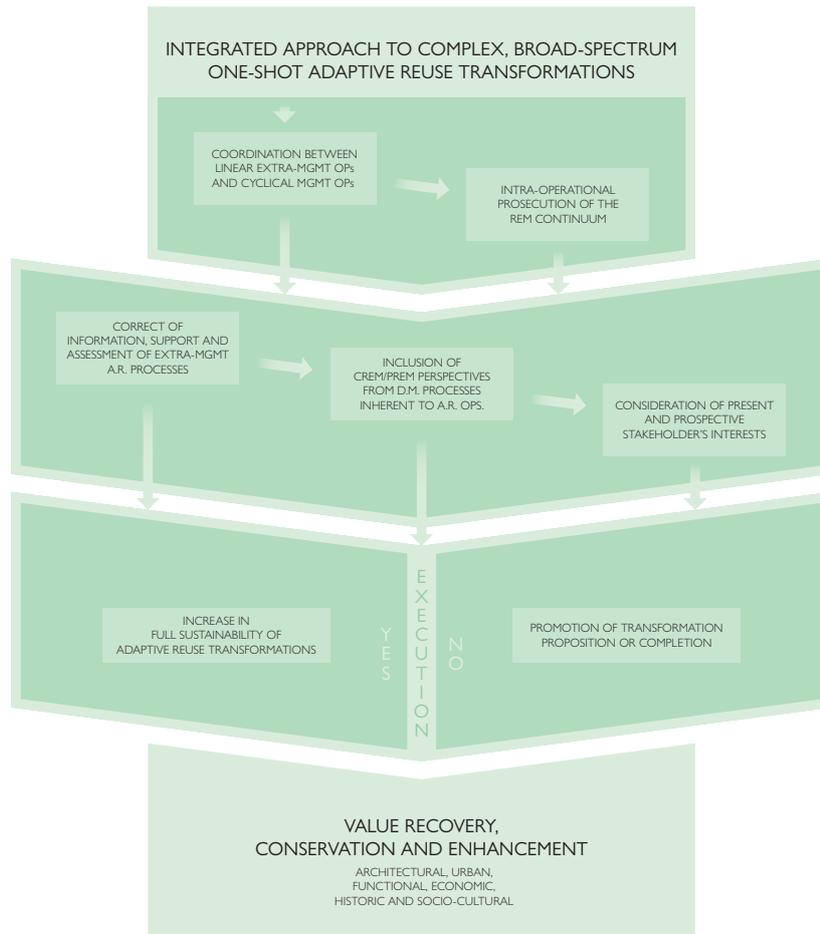


Fig. 3:
 The conceptual structure of this thesis and the trickle down effect expected following the integration of campus management throughout adaptive reuse operations for defunctionalized enlisted campuses.

1.6 Summary of the research coordinates

Problem Statement

The value losses inherent to defunctionalized historic campus-like architectural complexes are currently unavoidable. In the perspective of avoiding it through their adaptive reuse, this phenomenon occurs whether the campuses undergo such transformations (by demolition or degeneration) or do not (by degradation or abandon).

Hypothesis

The loss of values occurs because of the incapacity of current approaches to adaptive reuse operations to deliver performance in complex transformation scenarios such as the ones constituted by dismissed enlisted campuses. This is primarily caused by the mismatch between the inherently linear character of adaptive reuse operations and the campus management cyclical nature, which impedes the correct management of the transformations and interrupts the REM continuum. As main consequence, the necessary intervention domains cannot operate in an integrated environment, losing the managerial support consisting of their information, support and assessment. Because of this, the CREM/PREM perspectives are not preserved nor considered within the operations, leading to the depletion of present and prospective stakeholders' interests. These dynamics directly and indirectly preclude the full-sustainability of adaptive reuse operations (instating degeneration and demolition processes) up to prevent their execution (instating degradation and abandon processes) which eventually cause the loss of architectural, urban, functional, economic, historic and socio-cultural values.

Thesis

The thesis is developed considering the possibility of only reducing as much as possible the value losses, not completely avoidable due to the one-shot character of adaptive reuse interventions. In such perspective, the solution of the problem is identified in assisting the integration among the processes belonging to the adaptive reuse intervention domains. The assistance is provided by the definition of their integration and coordination frame and by the constitution of a toolset capable of providing the adaptive reuse project/process manager(s) to conduct, control and coordinate the operations. The operational scheme and the toolset should be employable regardless the specificity of each transformation case. If effective and viable, their employment would allow the correct information, support and assessment of the extra-managerial processes of the operations and include the CREM/PREM perspectives throughout the transformation progression. By doing so, it would also enable the adaptive reuse transformation to actively consider the interests of present and prospective stakeholders, which would then grant their support to the operations. These dynamics would then directly and indirectly contribute to increase the full-sustainability of the adaptive reuse operations, and promote their realization and their successful execution, eventually preserving, restoring and enhancing the architectural, urban, functional, economic, historic and socio-cultural values of the campuses. Additionally, the integration would also reinstate the intra-operational campus management processes and better connect the pre- and post-operational REM continuum. With

this, it would improve the coordination between the linear operations and the cyclical campus management processes, enabling to the better control of the extra-managerial intervention domains and to reduce the effect of their one-shot nature on the verification of further value losses.

Research question

(A) How can campus management theories be successfully employed to foster and support broad-spectrum adaptive reuse transformations of defunctionalized campus-like historic architectural complexes in order to contrast their loss of values?

Research sub-questions

(B1) How is it possible to match the domains involved in these adaptive reuse transformations to allow the REM processes throughout the whole execution of the operations?

(B2) How is it possible to integrate the campus management processes in the adaptive reuse operations to allow it to correctly inform, support and assess the processes of the other intervention domains?

(B3) How can campus management successfully introduce the adaptive reuse operations in the REM continuum without excessively disrupting it?

2 THEORETICAL FRAMEWORKS

Adaptive reuse interventions' inherently interdisciplinary nature is structured through transformation-specific frameworks that allow to selectively consider the specific domains/disciplines involved in each individual case. At the moment of writing, the most researched perspectives are the environmental, the technological and the socially-aware participative bottom-up ones (Wilkinson, Remøy, and Langston 2014; Wilkinson and Remøy 2018). For the purposes of this research and due to the consolidation of these aspects in the current common practice, they are implicitly considered as part of adaptive reuse instead of specifically mentioned. As the focus of this research is instead on the operational dynamics of adaptive reuse interventions on defunctionalized enlisted architectural complexes from an organizational perspective (rather than technical, financial, political etc.), this thesis considers three different domains: the managerial one, the financial/entrepreneurial one and the architectural heritage one. Each of them can be interpreted into adaptive reuse transformations through several stand-alone theoretical frameworks, but to better serve the purposes of this thesis are only considered the ones that respond to two specific requirements: reporting the decision making moments involved in the transformations and describing the discrete phases/processes brought by each domain into the operations in a chronological order. These criteria allow to integrate the processes within adaptive reuse transformation among them and to additionally better align and insert adaptive reuse operations and domains in the campus development continuity.

Real Estate Management theories

Due to the specific characteristics of the organizations and of the real estate portfolios considered, the CREM/PREM campus management theories of the management domain

are interpreted and employed through the DAS framework (de Jonge 1997; Krumm 1999; de Jonge et al. 2007; 2009; van der Zwart, van der Voordt, and Arkesteijn 2009; den Heijer 2011; Arkesteijn 2016) This framework allows to describe the iterative nature of the REM cycles performed by corporate and public organizations through its tasks and to consider the four CREM/PREM perspectives throughout the entirety of the operations. While this framework is particularly suitable to be employed in educational campuses, its structure allows it to be employed as well in campuses intended through the wider perspective considered in this thesis. Due to the operations in which the management domain is employed, this framework is going to be implemented with the knowledge based concerning the relationships between campuses and built environment derived by the use of CREM/PREM theories and the DAS framework (Curvelo Magdaniel 2016).

Architectural Heritage theories

Because of the necessity of operating in compliance with heritage regulations and policies to preserve, requalify and repurpose the dismissed facilities, the architecture domain theories are interpreted through the Designing From Heritage framework (DFH) developed in the Heritage and Architecture section of the faculty of Architecture and the Built Environment of the Technische Universiteit Delft (Kuipers and de Jonge 2017). By implementing standardized methods of heritage analysis which result in exchangeable reports and documents and that allow for interdisciplinary integration (Riegl 1982; Brand 1994; successively re-elaborated by van Balen 2008; Orbaşlı 2008; ERA Architects 2011), the DFH framework enables the otherwise difficult integration between the heritage and non-strictly architectural or socio-cultural dynamics. Additionally, the design from heritage framework allows more lean, efficient and effective multi-domain operations in extensive transformation processes thanks to the separation between its analytical and design phases and by the early implementation of decision making processes within the heritage operations (Kuipers and de Jonge 2017).

Financial/Entrepreneurial theories

Because of the necessity for a new function/organization and of the great amount of assets and resources required for the complete requalification of dismissed historic campuses, the transformation processes and the post-transformation function also require an entrepreneurial approach (Green 2015). Contextualized in the progressive development of adaptive reuse operations the financial, strategic and organizational efforts required to transform the campuses can often entail the need for a specific one-off project, department or venture actually capable of internalizing and generating similar performances. For this reason, the processes, theories and dynamics participating in the financial/entrepreneurial domain can be interpreted from an enterprise establishment viewpoint. In this task, the Delft Centre for Entrepreneurship offers an adequate framework (here referred to as DCE) to analyze and interpret them. Focusing on the final kick-off of the ventures and on their successful reach of their final business sustainability stage, this framework allows to control and comprehend the different phases and steps of the entrepreneurial initiative from its creation (Doran 1981; Porter 2008; Aulet 2013; Gupta 2013; Osterwalder et al. 2014; Green 2015; Kim and Mauborgne 2015; Trott 2016) to its development (Vohora, Wright, and Lockett 2004; Osterwalder and Pigneur 2010; Teece 2010; Aulet 2013;

Gassmann, Frankenberger, and Csik 2014; Joyce and Paquin 2016; Trott 2016) up until their final sustainability and profitability (Vohora, Wright, and Lockett 2004; Khodaei et al. 2012; Aulet 2013; Trott 2016).

Other frameworks

Other than being considered individually for their autonomous processes and dynamics, the three intervention domains are also appraised through the lenses of their contribution to adaptive reuse transformations. In this perspective, they conjunctively contribute – with their processes and control procedures – to complex projects whose conduction requires specific managerial and procedural competences (Project Management Institute 2017). Nonetheless, adaptive reuse transformations present several characteristics (among which the scale of intervention, the resources requirements, the social involvement and the time consumption typical of wicked problems) attributable to one-off, one-shot operations (Lindblom 1959; Bachrach and Baratz 1963; Rittel and Webber 1973; Kingdon 1984). Because of this, the analysis of the processes and of the entire operations is framed into the specific decision-making related theory relevant to rightly examine and understand the dynamics within these complex systems (Mintzberg, Raisinghani, and Théorêt 1976; Teisman 2002; de Bruijn and ten Heuvelhof 2008; Cairney 2011; Kingdon 1984).

3 ANALYSIS OF ADAPTIVE REUSE OPERATIONS AS PART OF CAMPUS DEVELOPMENT

Campus-based private and public organizations use campus management as a portfolio management toolset on an ordinary as well as an extra-ordinary basis (den Heijer 2011; Curvelo Magdaniel 2016). In ordinary portfolio management situations, campus management is in charge of exclusively conduct the necessary REM processes. The enactment of adaptive reuse transformations represents instead an extra-ordinary scenario, since their execution requires to include several processes belonging to one or more extra-managerial domains in the REM continuum. Because of this reason, in such circumstances campus management is demanded to perform additional managerial tasks. Firstly, it is required to inform the processes of the extra-managerial domains involved in the interventions (in their pre-operational phase). Secondly, it is required to support - directly and/or indirectly - their processes throughout the entire operations (in their per-operational phase). Thirdly, it is required to assess the results of the transformations at their conclusion, and to forward the outcomes to the following campus management cycles in order to maintain the REM continuum (in their post-operational phase). The contributions of campus management in each individual phase of the operations (pre-/per-/post-operational phases) converge in the perspective of providing an adequate management of the entire transformation project (de Bruijn and ten Heuvelhof 2008; Project Management Institute 2017).

3.1 Adaptive reuse operations in the rem continuum

The possibility for campus management to play such an extensive role in adaptive reuse transformations is due to the specific modality through which their operations are introduced in the REM continuum. This modality makes use of the differences between the

managerial cycles in which the need for an intervention is determined and the ones in which it is not. Analyzed through the DAS framework, each campus management cycle is described as consisting of four tasks operating between four CREM/PREM scenarios (fig. 4) (de Jonge et al. 2007; den Heijer 2008). A feedback element between two of the scenarios – the “future match” between the Current Supply and the Future Demand scenarios – determines the need for a REM intervention in each cycle. Due to its position, the future match allows to bypass the second half of DAS cycles when verified, while leads to execute them fully when it is not.

The REM tasks performed in case of a positive match are (1) the assessment of the current campus by comparison between the Current Supply and the Current Demand scenarios and (2) the exploration of the change in demand by comparison between the Current Demand and the Future Demand scenarios. Specifically, the first task of campus management (1) is to determine the qualitative and quantitative characteristics of the mismatch between what is the current performance of the campus in relation to what is currently demanded in the four CREM/PREM perspectives (den Heijer 2011, 123–33). This assessment starts with the definition of the relevant variables (consisting of CREM/PREM KPIs and parameters) composing the required set of management information (den Heijer 2011, 125 fig. 4.1), which is collected through the survey of the data currently available relatively from the present and past campus management analyses and operations (den Heijer 2011, 127 fig. 4.2). The drafted prospectuses describing the Current Supply scenario in the four CREM/PREM perspectives are then employed as templates for surveying the Current Demand scenario. The (mis)match between the two actual and hypothetical situation is employed to (2) explore the trends of the changing demand and determine the possible Future Demand scenario to which the campus development should tend (den Heijer 2011, 153–57). This predictive anticipation of the Future Demand scenarios allows to identify the future (mis)match between it and the Current Campus, so to eventually define the programmatic requirements of the campus development transformations on which can be based the further managerial tasks (den Heijer 2011, 154). A comparison between the Future Demand and the Current Supply scenarios resulting in a verified match determines the uselessness of a REM intervention and short-cuts the current DAS cycle, prompting to start the following one.

In the eventuality of a negative match, the first two tasks are instead followed by (3) the generation of future models between the Future Demand and the Future supply scenarios and (4) the definition of a transformation process to convert the Future Supply scenario in the Current Supply scenario of the future campus (fig. 5). These two additional tasks define the nature, the extents and the terms of the needed intervention, informing the eventual execution process and prompting to the continuation of the REM continuum. Specifically, the third task (3) generates the necessary campus development models to identify the characteristics required by the Future Supply scenario to deliver the performance expected by the Future Demand one (den Heijer 2011). In consideration of the (probably) different of flows, relations and dependencies between the future campus and its future external environment and of their consequences on the future campus' internal dynamics, these models should consider extensively the range of available opportunities for the many aspects of the campus development and configuration (den Heijer 2011). While this clearly includes the CREM/PREM perspectives, in the terms inherited from

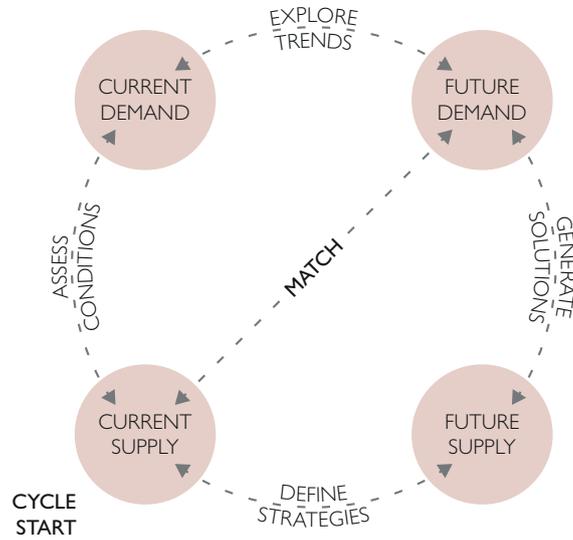


Fig. 4:
The DAS cycle (interpreted from den Heijer 2008)

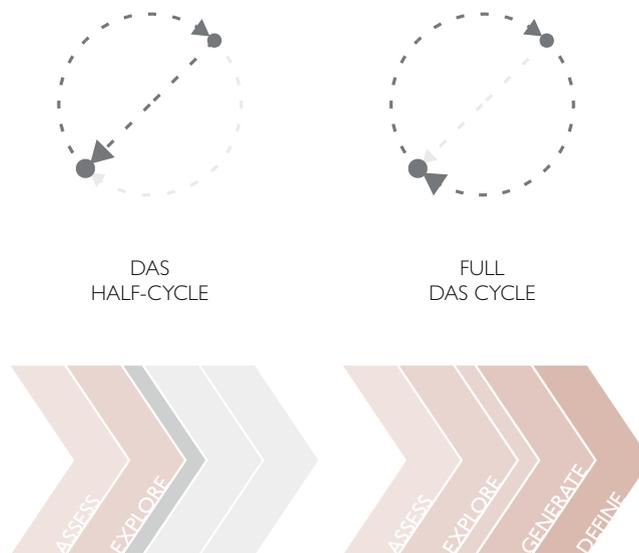


Fig. 5:
The comparison between a full DAS cycle (negative match) and a DAS half-cycle (positive match)

the previous tasks of the current DAS cycle, it also encompasses other notable factors. Internally, they configure the CREM/PREM tasks necessary for campus management to increase the performance of the campus portfolio in relation to the four CREM/PREM perspectives (den Heijer 2011, 179 fig. 6.3); externally, they determine the relationships between the campus and its wider (global), intermediate (regional) and immediate (city) contexts, defining the strategic mission/vision, the functional objectives and the required mix and the (mutual) connections with the immediate surroundings (den Heijer 2011, 175–76, 180–89, 197–99). Among the generated models, the one that most appropriately satisfies the Future Demand by developing the Current Supply into the Future Supply is employed to (4) define the transformation projects relatively to the present DAS cycle (den Heijer 2011). Independently from the completeness of the available management information – and the consequent likeliness of a reactive, proactive or mixed approach to the definition of the transformation project – the resulting campus development operations have to be expressed in the relevant CREM/PREM KPIs and variables' trends and through the management tasks identified throughout the DAS cycle about to be concluded (den Heijer 2011, 203–4).

The great majority of cycles constituting the campus management operations are full DAS ones, resulting from the negative future match between the Current Supply and the Future Demand scenarios. Their succession entails steady enaction of generally contained and incremental interventions, globally perceivable as the natural development of the portfolio. The situation is typically different for extra-ordinary operations involving decision making on extensive organizational and/or real estate reforms like adaptive reuse transformations. In these cases, the future match is often positive (or so considered) and the REM continuum is represented by a sequence of DAS half-cycles with occasional full cycles corresponding to the execution of the necessary transformations. These few negative matches are the precise moments in which adaptive reuse operations are introduced in the REM continuum, and in which campus management can contribute to the success of the extra-managerial elements of the interventions. Specifically, adaptive reuse operations make use of the second half of the full DAS cycle (tasks 3 and 4, resulting from tasks 1 and 2) to generate the information necessary to the processes of the other domains, which take place between the end of the full DAS cycle and the beginning of the following one. Also, the adaptive reuse transformations inherit from the full DAS cycle the necessary managerial know-how to support their operations and the whole project of intervention. Ultimately, the conjunction to the first task of the following DAS cycle (assessment) provides the adaptive reuse transformation with the necessary operational closure procedure while recovering the REM continuum (fig. 6).

This way, the inclusion of adaptive reuse operations in the REM continuum accommodates the processes of the extra-managerial domains involved in the interventions between two REM cycles: after the pre-transformation informant full DAS cycle and before the post-transformation assessor DAS half-cycle. Because of this, adaptive reuse transformations create a gap in the continuum of REM and of campus management processes, decreasing the control that organizations exert on their portfolios during their execution. Additionally, this gap reduces the control that organizations wield on the adaptive reuse transformations themselves, even if operations embed to certain extents the managerial know-how from the pre-intervention full DAS cycle. This happens because of the actual

separation between the campus management processes and the CREM/PREM scenarios before and after the transformations, which hinders the tracking of the operations and eventually the achievement of the expected results. Generally, every operation included in the REM continuum that involves processes from external domains represents a potential managerial gap. The wider this interruption, the stronger the negative impact on the control of the portfolio, of the operations and of the transformation outcomes. The extents of the solutions of continuity depend on several factors inherent to the interventions carried out.

Unlike smaller, more easily-controllable interventions, bigger transformations characterized by a high complexity, presenting a cross domain nature and with a broader scope of action end up entailing a greater gap in the REM continuum. Such interventions can often involve one-shot operations, eventually becoming wicked problems (Rittel and Webber 1973). In such circumstances the solution of continuity reaches even greater extents. The result is a dramatic increase in the chance of precluding the full sustainability of the operations and depleting current and prospective stakeholders' interest, even up to preventing the interventions' execution. This is often the case for adaptive reuse transformations of defunctionalized enlisted campuses, since they require to execute highly complex and interdependent processes from several intervention domains, involving great resources expenditures and networks of stakeholders (Wilkinson, Remøy, and Langston 2014). Consequentially, the inclusion of adaptive reuse interventions in the REM continuum contributes to the instatement of processes leading to the loss of values of dismissed historical architectural complexes.

3.2 The current structure of adaptive reuse operations

Campus management incorporates adaptive reuse operations into the REM continuum by accommodating the processes of its extra-managerial domains between a pre-intervention full DAS cycle and a post-intervention DAS half-cycle. In such span, adaptive reuse transformations procedurally organize the implementation of the involved additional domains dependently on the nature of each (type of) intervention. For this purpose, adaptive reuse operations are arranged upon a serially-organized model whose only fixed elements are the first domain (the managerial one) and the final execution phase which closes the operations and reconnects to the post-intervention assessor DAS half-cycle (de Jonge et al. 2007; 2009; den Heijer 2011). For all intents and purposes, the serial organization of the domains within adaptive reuse operations constitutes an actual model by which the interventions are procedurally planned.

The adoption of a serially-organized operational model facilitates the control of the inherent complexity of adaptive reuse operations. In a first place, it eases the selective inclusion (or exclusion) of the necessary intervention-specific domains. In a second place, it empowers each domain to execute their internal processes with relatively autonomy, entering and exiting the operations without disrupting them. In a third place, it enables the autonomous and selective activation of domain-specific individual intervention processes, simplifying the complex task of controlling and supporting the operations. Eventually, the serially-organized operational model effectively prevents the excessive hindrance potentially

brought by the introduction of highly complex, broad-spectrum, cross-domain and one-shot operations (Teisman 2002). However, each one of these effects also introduces different criticalities in the adaptive reuse operations. Specifically, the greater autonomy enjoyed by the extra-managerial domains hinders the information transfer between one and the following. The perturbances in the information transfers are due to the different parameters and fields by which they operate, which forces them to interpret the information incoming from the previous domain and to adapt their own outcomes to instruct the one following. Additionally, this allows only the first of the extra-managerial domains to be directly informed by the managerial one and forces the subsequent ones to enact their processes in function of previously manipulated data. As a consequence of the lack of direct communication throughout the entirety of the operations between the REM processes of campus management and the other intervention domains, the latter are inhibited from being correctly informed, supported and ultimately assessed. Nonetheless, this entails the exclusion of the CREM/PREM perspectives from good part of the adaptive reuse operations. Eventually, this establishes inconsistencies between the adaptive reuse transformation initially defined by the pre-intervention full DAS cycle and the final outcomes of the operations' execution.

Analogously to what observed for their insertion in the REM continuum, the current operational model by which adaptive reuse operations are procedurally organized precludes on multiple levels the full sustainability of the operations. Potentially, its criticalities can become so substantial to hinder the operations, even up to interrupt them before their completion, hence preventing their execution. Therefore, the inherent structure of adaptive reuse transformations adds to the factors contributing to the instatement of processes leading to the loss of values of dismissed historical architectural complexes.

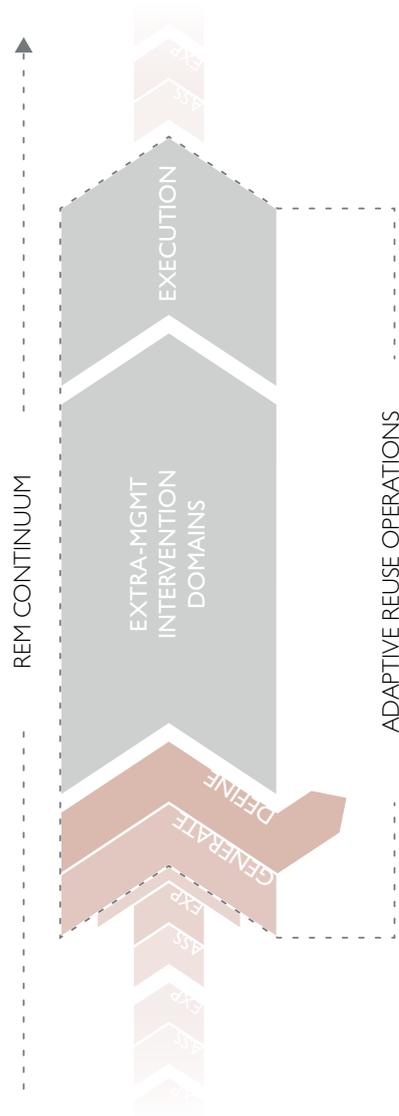


Fig. 6: The diagram shows the incorporation of the adaptive reuse operations in the REM continuum

3.3 The extra-managerial domains within adaptive reuse transformations of dismissed historic campuses

As observed for the introduction of adaptive reuse operations in the managerial continuum, the full DAS cycle preceding the extra-managerial processes informs them through the processes within its third (future model generation) and fourth (transformation definition) tasks. This is done by means of instructions generally based upon the consideration of intervention-specific KPIs (den Heijer 2008) which additionally provides the extra-management domains with the criteria to control their operations. Nonetheless, campus management prearranges the span to accommodate the extra-managerial operations within the REM continuum. The specific case of adaptive reuse transformation of defunctionalized enlisted campuses mobilizes processes belonging to two additional intervention domains. In a procedurally chronological order, these are the financial/entrepreneurial one and the architectural heritage one (fig. 7).

The first execution of the processes from the financial/entrepreneurial domain responds to the necessity of introducing a new organization and/or function in the facilities following the dismissal of the one previously installed. Furthermore, it is aimed to ensure its profitability and overall sustainability (Osterwalder and Pigneur 2010; Gassmann, Frankenberger, and Csik 2014; Joyce and Paquin 2016). In presence of organizational and functional continuity, these tasks are addressed by campus managers within the application of the CREM/PREM perspectives (particularly the functional, strategic and financial ones jointly) in the management processes. In its absence, however, they involve more complex processes oriented to the establishment of a profitable entrepreneurial venture capable of reaching its final sustainability stage (Vohora, Wright, and Lockett 2004; Clarysse et al. 2006). Such requirement assumes a greater relevance in the light of the fact that many ongoing and completed adaptive reuse transformations fail in their purposes because of the unviability of their operations or of the unprofitability of the installed organizations/functions (Vohora, Wright, and Lockett 2004; Khodaei et al. 2012; Ajroldi et al. 2013; Zanzottera 2013).

3.3.1 The processes of the Financial/entrepreneurial domain

Through the DCE framework, the financial/entrepreneurial domain consists a linear sequence of five processes oriented towards the creation of a successful venture. They are (1) the opportunity identification and (2) the opportunity analysis (constituting the opportunity recognition), then (3) the determination of the value proposition, followed by (4) the creation of a business model which ends up in (5) the kick-off of the venturing process (fig. 8). Each one of these processes is provided with one or more tools that contribute to overcome the critical junctures between the development stages of the entrepreneurial initiative and contribute to increase the chances for ventures to reach their final sustainability stage (Vohora, Wright, and Lockett 2004; Clarysse et al. 2006; Khodaei et al. 2012; Aulet 2013; Trott 2016).

Firstly, the opportunity recognition (1 and 2) provides the Opportunity Analysis Canvas (also known as OAC - Green 2015), on which it is actually based. The OAC consists of a nine-step tool organized in three main actions (thinking, seeing and acting

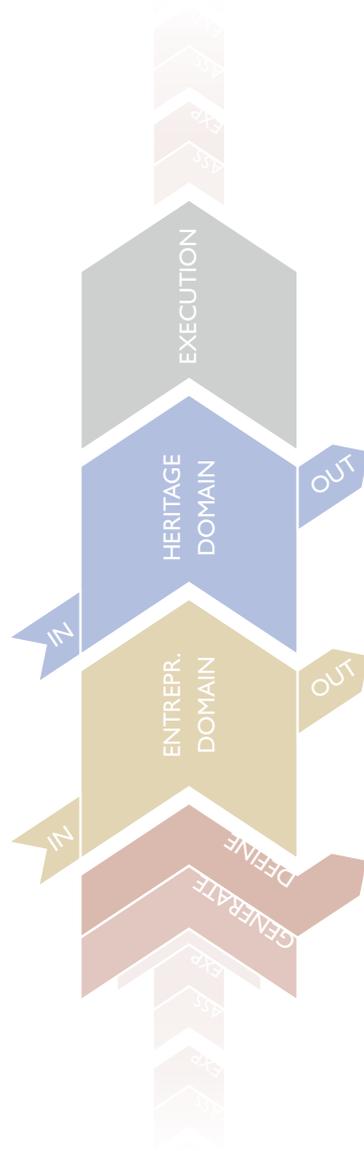


Fig. 7:
The configuration of adaptive reuse operations in the REM continuum of defunctionalized historic campuses.

entrepreneurially) to identify and analyze entrepreneurially the opportunities that prompt to the creation of ventures. In a similar fashion, the Value Proposition Canvas (also known as VPC - Osterwalder and Pigneur 2010; Osterwalder et al. 2014) is employed to determine a value proposition (3) that successfully creates values in the interests of current and prospective stakeholders (Teece 2010; Aulet 2013). The VPC achieves it by drafting value maps based on the profiles of the stakeholders. These consider three main performance indicators: the stakeholders' pains, their gains and their interests relatively to the operations (or benefits) due to the proposed organizations (or functions). The opportunity recognition and the Value Proposition are then used to create a suitable business model (4). This is achieved by first drafting a business model definition (Gassmann, Frankenberger, and Csik 2013) and then by perfecting it through its framing in the most adequate among the Business Model Canvases (also known as BMCs - based on Osterwalder and Pigneur 2010; Gassmann, Frankenberger, and Csik 2014), selected dependently on the specificity of the progressing venture. BMCs allow to create venture-tailored business models by integrating the elements of the value proposition in a wider nine-elements context comprehensive of all the relevant business-related aspects. The creation of a business model represents a big leap forward in terms of detailing and complexity for organizations and constitutes a critical point in the control and assessment of the entrepreneurial risk (Aulet 2013). For this reason, organizations usually recur to empiric databases to choose how to set-up the most appropriate business most appropriate business model for their venture (Gassmann, Frankenberger, and Csik 2013; 2014). A valid business model best allow the venture to reach the final stages of its development and to overcome the relative critical junctures (Vohora, Wright, and Lockett 2004; Aulet 2013; Khodaei et al. 2012; Trott 2016), leading definitively to its kicked-off (5). The entirety of the processes of the financial/entrepreneurial domain, from the opportunity recognition to the venture kick-off, should be considered in the broader business environment in which they take place (Osterwalder and Pigneur 2010; Aulet 2013; Green 2015; Trott 2016). This environment can positively or negatively influence them at any time, statically or dynamically, up to determine the opening or the closure of the necessary windows of opportunity (Kingdon 1984). The financial/entrepreneurial domain also allows organizations to analyze, understand and take advantage of it, providing them with tools such as the Environmental PEST analysis (also known as PEST(LE) - Gupta 2013) or the SWOT analysis (employable also for assessments) and the 5-Forces strategy (Porter 2008) or the Blue ocean strategy (Kim and Mauborgne 2015). For them to be effective, the venture has to set fixed operative milestones, scheduled and planned in terms of clear entrepreneurial and managerial goals and objectives (Doran 1981).

3.3.2 The processes of the architectural heritage domain

Progressing from the managerial domain through the financial/entrepreneurial one, the adaptive reuse operations acquire further detailing. With that, they also generate more information with which to inform the following architectural heritage intervention domain. This domain addresses the physical, functional, design and preservation aspects of the transformation of dismissed enlisted campuses, while dealing with the limitations and the potential of intervening on historic portfolios. Furthermore, it translates the information it receives and generates into the actual architectural intervention to be executed at the end of the entire adaptive reuse operations. Similarly to what observed for

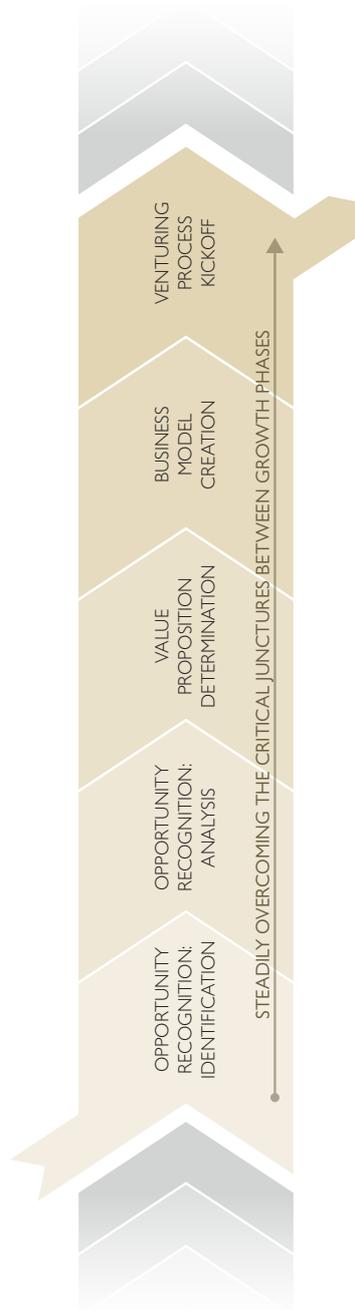


Fig. 8:
The linearly organized processes of the financial/entrepreneurial domain as in the DCE framework.

the financial/entrepreneurial domain, these tasks would normally be addressed by the CREM/PREM perspectives within the REM continuum (particularly the physical, the functional and the strategic ones). The enlisted status of the campuses however requires the enforcement of complex regulations (among which the ones regarding restauration, preservation, conversion etc.), whose compliance calls for the inclusion of dedicated processes not pertaining to the managerial domain.

These architectural heritage domain processes are positioned in a specific multi-factor setting that requires them to negotiate between design, technology and cultural values (Meurs 2016). Through the DFH framework, the architectural heritage domain contributes to adaptive reuse operations with five processes that, performed in a linear succession, allow to analyze and evaluate the heritage in order to realize more aware and effective preservation/transformation interventions (Kuipers and de Jonge 2017). First there is (1) the chronological mapping of the relevant historical events concerning the heritage in object, then (2) its full anamnesis. Successively, there is (3) the mapping of the values it represents and the definition of their levels of significance, followed by (4) the definition of the intervention dilemmas that finally leads to (5) the design of the architectural heritage intervention (fig. 9). Each of these processes uses one or more specific tools that facilitate their consideration of the multiple aspects and scales involved in architectural operations.

The chronomapping (1) compiles an accurate historical report of the architectural heritage from its first construction to its latest status. In this task, the mapper has the responsibility of understanding and considering all the facets of the historic development of the heritage. Most importantly though, it has to decide which among the collected information is most relevant to the following processes (Cramer and Breitling 2007). The on-site anamnesis (2) thoroughly inspects and investigates on the condition and the significance of the heritage and of its components (Kuipers and de Jonge 2017). Their understanding, subdivision and grouping is based on the concept of a building's sharing layers (Brand 1994), which the mapper selects and defines dependently on the specificity of the case in analysis. The following mapping of the values and of their levels of significance (3) is based on the compilation of the Heritage Value Matrix (also known as HVM - Kuipers and de Jonge 2017). The HVM inherits the outcomes of the anamnesis based on Brand's shearing layers and correlates it with the inherent values of the heritage (Riegl 1982) to be used as a base for the mapper to identify and define a system of case/type-specific values that better suit the purposes of the architectural approach (Orbaşlı 2008; ERA Architects 2011; Kuipers and de Jonge 2017). The incorporation in the HVM of Brand's layers and Riegl's values returns an intuitive scheme to visualize where are the heritage values located and what is their current state compared to the others. Additionally, it allows to attribute to each one of them (or to their groups) specific levels of significance, which enables the subject in charge of the architectural heritage processes to make more informed choices while defining the intervention dilemmas (4) (Kuipers and de Jonge 2017). The knowledge based generated through the processes 1,2 and 3 find their ultimate purpose in this fourth step, which defines the dos and don'ts upon which to design the adaptive reuse interventions (5). In this last process, the adaptive reuse transformation acquires a defined physical, procedural and functional shape and incorporates the requirements set by the previous operational domains. Eventually the transformation proposal passes through the

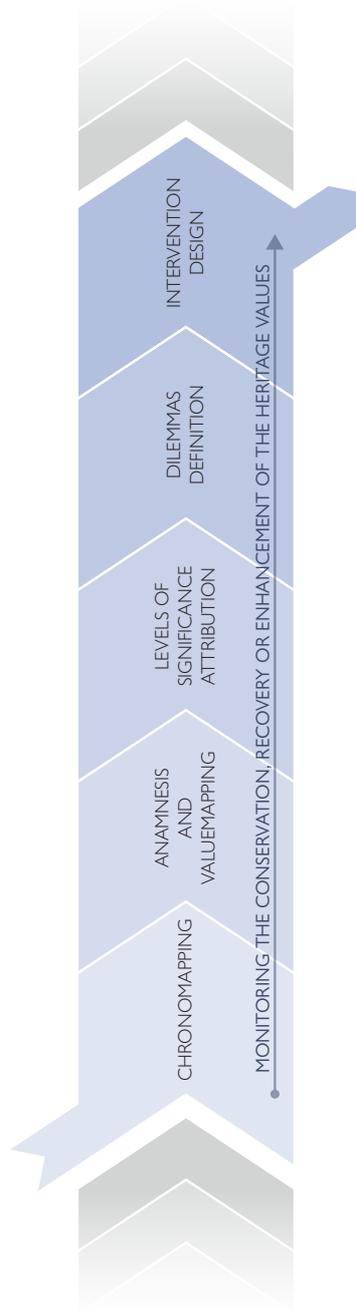


Fig. 9:
The sequence of processes of the architectural heritage domain as by the DFH framework.

validation of the existing regulations before finally being consigned to the adaptive reuse transformation execution.

3.4 The sequence of processes involved in the adaptive reuse transformation of defunctionalized enlisted campuses

The case-specific adaptive reuse operational model employed in the transformations of defunctionalized enlisted campuses can be summarized in its entirety as following. Correspondently to the missing match between the Current Supply and Future Demand scenarios, campus management determines the necessity of intervening on its real estate portfolio through means of adaptive reuse. Following this decision, adaptive reuse operations are introduced in the REM continuum through the completion of the management cycle that verified the scenarios' mismatch. The analysis conducted by the assessment of the current campus and the exploration of the changing demand is used by the management domain to generate future models and to define the required transformation project. This is drafted in the four CREM/PREM perspectives through the identification (and use) of the most appropriate KPIs to monitor the adaptive reuse transformations. The KPIs are defined to be easily implementable and understandable by the other domains involved in the operations. Their employment allows the additional operational domains to be instructed with the right data by campus management while partially incorporating its control processes.

Such information is directly transferred to the entrepreneurial domain, whose performance is necessary to instate a new organization/function capable of supporting the transformation and generate sufficient turnover. For this purpose, the processes of the financial/entrepreneurial domain focus on recognizing the right opportunity to create a value proposition capable to grant the necessary support from current and prospective stakeholders. On these elements, they then define a business model capable of supporting the operations and generate a scenario at the transformation completion in accord with the goals initially set by the KPIs. The generated business model is used to gather the constituents and the stakeholders to kick-off the adaptive reuse venturing process, consisting in the instatement of a new function/organization in the enlisted campus.

The venture created then participates to the definition of the necessary architectural intervention, transferring the interpreted managerial information and the strategic/entrepreneurial information to the architectural heritage domain. At the recognition of the functional, managerial and organizational programs defined by the previous domains, the architectural processes collect and analyze the data critical to the comprehensive information of the design proposal. The historical-chronological, material and evocative maps of the heritage - together with the outcomes of the operations previously enacted - are used to determine the significance of each aspect of the transformations. Additionally, they are used to draft a design proposal that effectively negotiates between the managerial, the entrepreneurial and the architectural perspectives. The resulting adaptive reuse transformation proposal is then transferred to the execution phase, which brings it to completion and feeds it back again into the REM continuum to be finally assessed (fig. 10) .

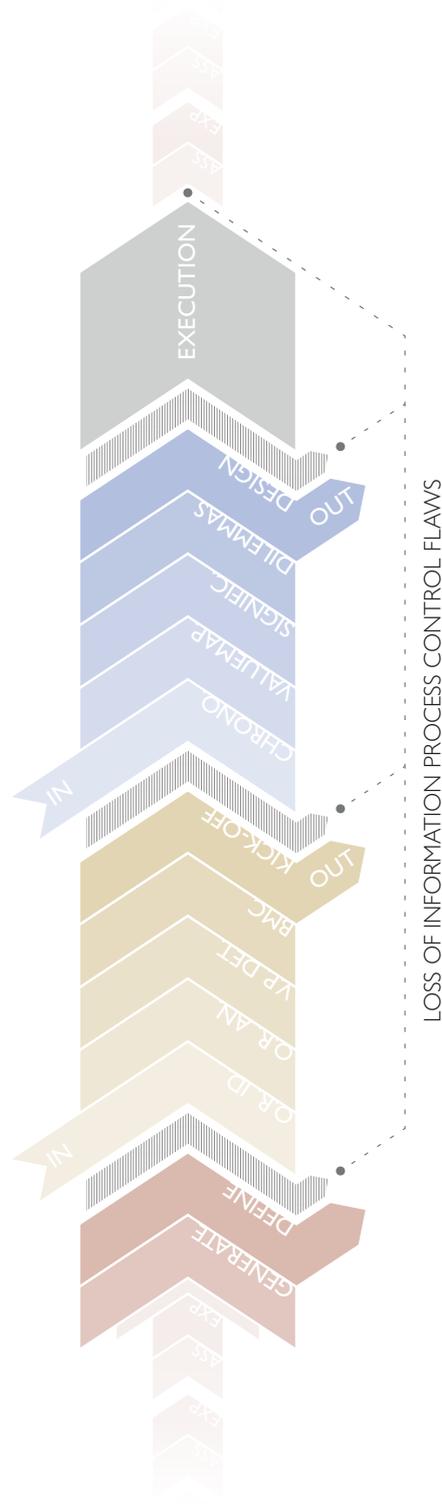


Fig. 10:
The adaptive reuse operational model employed for defunctionalized enlised in its detail, inserted in the REM continuum.

3.5 The effects of the serially structured operational model on the transformation of defunctionalized enlisted campuses.

Because of their complexity, adaptive reuse operations present all the advantages and disadvantages caused by their insertion within the REM continuum and the ones due to the serial organization of their intervention domains within the operations. Additionally, the detailed study on adaptive reuse operational models employed for the transformation of dismissed historic architectural complexes reveals further insights on the mechanics that compromise the success of the operations. In a first place, the definition of the KPIs is done on a standard predictive basis. Despite the efficiency and the accuracy of the managerial decision making of the installed organization, it can't accurately understand neither foresee the specific processes inherent to the other domains nor to the introduced function/organization. This partially deprives them of their relevance at the eyes of the other intervention domains, increasing their chances of being ignored, modified or incorrectly estimated. As a consequence, it also reduces the efficacy of the process and project management dynamics implemented throughout the operations. In a second place, the substantial participation of the newly created entrepreneurial venture to the operations partially depletes the purposes initially set by campus management. The constitution of a venture represents a one-shot operation, which binds the success of the whole transformation to the success of the venture itself. Because of this, the criteria set by the entrepreneurial processes partially override the ones previously set by the managerial domain through the KPIs and jeopardize the nature of the transformation. In a third place, the entrepreneurial domain directly informs the architectural heritage one without the mediation of the managerial domain. This unbalances the CREM/PREM parameters instructed to the last intervention domain, particularly prejudicing the physical perspective hence lowering the considerations of the preexistent architectural qualities. In a fourth place, the architectural domain is required to negotiate between perspectives not easily frameable into its boundaries. While on one side the information received by the previous operations and generated within its processes contribute greatly to the definition of a coherent transformation proposal, on the other they add a further level of complication to the decision making concerning the heritage. This excessive load is reflected by a reduction of efficacy in the definition of the intervention dilemmas and design proposal, which rarely meets even the basic requirements of the three intervention domains without substantial compromises. Furthermore, the architectural intervention is inherently a one-shot operation, subject to the same considerations made for the venture kick-off. In this perspective, the complication of its processes jeopardizes even more the success and the completion of the entire operations. In a fifth place, the separation between the conclusion of the processes of a domain and the introduction of another's partially stop or reset the operations, which wait for the review of the elements pertaining to both domains resumed by the second. Such interruption furtherly increases the gap in the REM continuum and hinders the managerial control processes inherent to the operations. Additionally, this entails serious losses of information concurrently with its transfer from one domain to the following.

Overall, the additional flaws affecting the adaptive reuse transformations of defunctionalized enlisted campuses reinforce the assumptions of the hypothesis regarding the instatement of processes leading to the observed value-losses. Most importantly, they specifically point out to the fact that the missing integration of campus management processes in the

adaptive reuse operations, while simplifying the procedural execution of the transformations, also constitutes a major hindrance factor to the realization of the transformations themselves.

3.6 A viable alternative to the current adaptive reuse operational models

The analysis of adaptive reuse transformations of dismissed enlisted campuses confirms and strengthens the initial hypothesis that the hindrances to their successful execution – which lead to value losses by preventing their full sustainability up to preventing their enactment – are mostly inherent to their serial structure or the operations. Specifically, the hindrances occur because of the lack of integration between the managerial domain and the extra-managerial ones throughout the operations, originally provided to ease the intervention processes in such highly complex scenarios. In this perspective, the analysis indicates to intervene on the observed problem by reconsidering the inner organization of the adaptive reuse operational model employed in these situations. The generated information points towards conducting the transformations through a different structure that enables the otherwise unspontaneous synchronization among the intervention domains and their processes. This would avoid the discontinuities and flaws in the information transfer and process control internally the transformations. It would also allow the REM processes to guide and support the operations from their start to their conclusion, hypothetically reintegrating the CREM/PREM perspectives throughout the transformations and ensuring a greater correspondence between the proposed and executed transformations.

The investigation on the role of campus management in the adaptive reuse operations previously illustrated in this research (see section 1.2) already concluded that such alternative operational model should align to the concept of parallel domain-specific pipelines rather than to the serial, consequential succession of the processes. Though, the analysis of the intervention domains active in adaptive reuse transformations of dismissed enlisted campuses allows a first, more detailed definition of how to practically and theoretically actualize this modification. An ideally parallelized alternative operational model should specifically allow each domain's equivalent processes to take place in relatively similar moments of the operations, introducing a greater coherence among their results and allowing overviews of the whole transformation picture at every stage of the interventions. The introduction of a so much more consistent level of coherence among the intervention domains (transversally) and between their internal processes (longitudinally) corresponds to an equally consistent increment of the complexity of these operations. This increase is due to a second factor other than the necessity of controlling and coordinating at the same time several processes from different parallel intervention domains. It is in fact additionally related to the attempt of aligning cyclical, recursive REM processes with inherently linear and one-shot entrepreneurial and architectural operations (fig. 11). For this reason, a special effort in the alignment, synchronization and integration of the intervention domains should be put in tightly and precisely matching the management processes to the extra-managerial ones in order to provide them with a sufficient level of guidance and control (fig. 12).

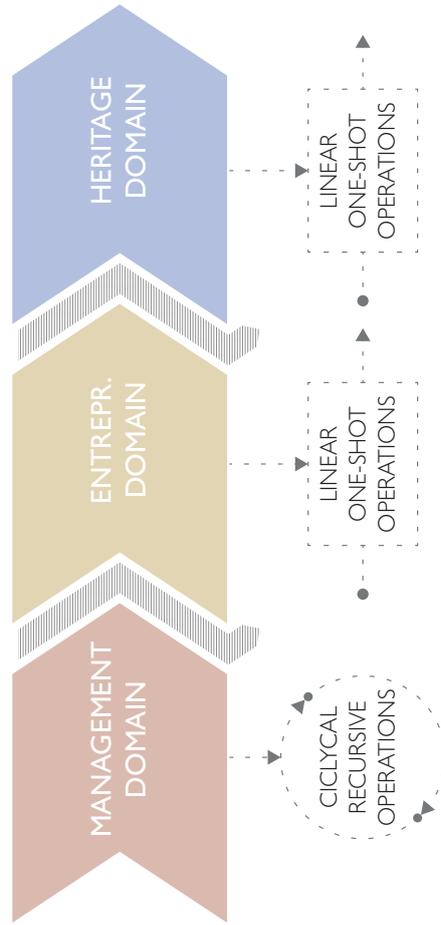


Fig. 11:
The chronological order of the domains involved in adaptive reuse operations of dismissed architectural complexes and their inner procedural configurations.



Fig. 12:
The schematic representation of the hypothetical alternative adaptive reuse operational model.

4 DEFINING AN INTEGRATED ADAPTIVE REUSE OPERATIONAL MODEL

The operational model currently available for the adaptive reuse transformation of dismissed historic architectural complexes has shown to cause value-losses due to the discontinuities it introduces on two different levels. On one hand there are those resulting from the introduction of adaptive reuse operations in the REM continuum, while on the other hand the ones caused by the inclusion of extra-managerial intervention domains in the operations themselves. As a consequence, the implementation of an integration criteria in the definition of an alternative adaptive reuse operational model should be carried out considering both these aspects. Specifically, it should aim to the alignment of the three individual domain pipelines to allow their parallel execution, restoring the REM continuum while also eliminating the interruptions due to the start/conclusion of each domain's specific operations. Also, it should be directed towards a transversal procedural synchronization among the autonomous processes pertaining to the three managerial, financial/entrepreneurial and architectural heritage domains, leading to a more effective, cross-domain coordinated exchange of coherent information.

4.1 Aligning the extra-managerial domains: procedure matching and operational phases

Among the three intervention domains that take part in the adaptive reuse transformation of dismissed historic campuses, the linear procedural organization of the financial/entrepreneurial and architectural heritage domains defines the limits within which to search for possible contact points within the three autonomous operational pipelines. Although visualizable through their own distinct and autonomous frameworks, the processes of the

two domains constitute actual stand-alone projects. Differently from the recursive, incremental and predictive dynamics of campus management, these linearly-organized procedures represent one-off operations and require to be approached through use of process and project management strategies (Project Management Institute 2017). These strategies identify five process areas on which one-off projects are procedurally organized: Initiation, Planning and Design, Execution, Monitoring and Control, Closure. Their employment into the two one-shot extra-managerial domains involved in adaptive reuse transformation, however, requires their further inflection in five distinct procedures that differ slightly from the conventional process areas valid for one-off (but not one-shot) operations. These procedures are initiated by (1) the ex-ante analysis, which followed by (2) the interpretation of its results and (3) their elaboration into a project proposal finally lead to (4) the execution of the interventions and to (5) their ex-post assessment. Each of these one-off, one-shot project procedures are included into the adaptive reuse extra-managerial domains operations by one or more of the processes from their specific frameworks.

On one hand, the financial/entrepreneurial domain (1) ex-ante analyzes the pre-operational situation through the processes inherent to the opportunity recognition with the help of the most appropriate tools (among the others: Porter 2008; Gupta 2013; Kim and Mauborgne 2015; Green 2015). Successively, it (2) interprets the information framed in the OAC by determining a value proposition on the mainlines on the VPC (Osterwalder et al. 2014). After that, it (3) elaborates on the viability and configuration of the venture for a prospective new function and/or organization by creating a suitable and complete business model (Osterwalder and Pigneur 2010; Teece 2010; Gassmann, Frankenberger, and Csik 2014). Then, it (4) executes the entrepreneurial initiative by kicking-off the entrepreneurial venture activating the stakeholders, channel, dynamics and networks included in the drafted BMC, in order to eventually successfully deliver the designated products and services. Ultimately, it (5) assesses ex-post the success of the venture by verifying the reach of the final sustainability stage of the venture and the generation of a turnover to be reinvested. From the analysis to the assessment, the process is monitored by verifying the overcoming of the critical juncture between the growth stages (Vohora, Wright, and Lockett 2004; Khodaei et al. 2012).

On the other hand, the architectural heritage domain (1) ex-ante analyzes the pre-operational status quo by executing its first two processes, resulting in the chronomapping, anamnesis and valuemapping of the historic architectural complexes and in their HVM. Successively, (2) it interprets the findings by attributing the levels of significance to the respective values on the HVM. Then (3) it elaborates the project themes by using the HVM to define the heritage preservation and transformation dilemmas and translates them in an intervention by (4) executing the designed heritage transformation project. Finally, it (5) ex-post assesses the effectiveness of the transformation by verifying the restoration, preservation or enhancement of the values in the ex-ante HVM (see previous references to van Balen 2008; Spaan 2013; van Hees, Naldini, and Roos 2014; Meurs 2016; Kuipers and de Jonge 2017). The procedural framework that characterizes the autonomous operations of the two linear domains employed in the adaptive reuse transformation of dismissed enlisted architectural complexes presents two additional similarities. The first is the use that they make of the physical and functional properties of these campuses as an input to activate the entrepreneurial think-see-act dynamics in the opportunity

recognition and to push the opportunity for the heritage transformation and for the. The second is the restitution of the results of the heritage and entrepreneurial interventions to the campuses so to be incorporated in their renewed set of functional and physical traits.

The procedural organization - consisting of input, analysis, interpretation, elaboration, execution, assessment and output – is not the only way through which the operations of the financial/entrepreneurial and the architectural heritage domain can be framed. In fact, the ex-ante nature of the processes within the analysis procedure and the ex-post nature of the processes within the assessment one, allow a comprehension of the extra-managerial interventions in a different, operationally-oriented perspective. In this light, the ex-ante analysis represents the necessary preparatory phase of the operations while the ex-post assessment represents its conclusion phase, both not involved (strictly speaking) in the operations. Such separations allow to identify three moments that, grouping the procedures and the processes within the pipelines of these two domains, define the phases of their operations: the pre-operational, per-operational and post-operational phases. Consequentially, the processes participating to the financial/entrepreneurial and the architectural heritage domain pipelines, while framed through their own domain-specific frameworks, are organized following matching procedural and operational structures (fig. 13). Because of this, they can be easily aligned parallelly (as a whole) and their internal processes can be hypothetically synchronized in coherent procedures and operational phases.

4.2 Adapting the campus management to the other extra-managerial domains

After parallelly aligning the inherently linear operations of the financial/entrepreneurial and architectural heritage domain through their common procedural framework, the effort goes to the integration among the managerial and extra-domains within adaptive reuse transformations. Because of the recursive cyclical nature of campus management, however, it is impossible to proceed to this further level of consolidation recurring to the procedural framework specific to linearly organized operations. Due to the participation of the different intervention domains in the same adaptive reuse operations, the alignment can be however facilitated in an operational framework perspective rather than in the procedural one. Accordingly to the outcomes of the analysis of adaptive reuse operations within the REM continuum in fact, campus management is demanded a three-fold performance to successfully allow the insertion of such complex dynamics without disrupting the managerial continuity nor the operations themselves. Specifically, it is required, to inform the adaptive reuse operations, to support and control them and to finally assess their outcomes. While performing these three tasks consequently, campus management autonomously prepares the adaptive reuse operations by informing them ex-ante and as much autonomously closes them with their ex-post assessment, independently from one another and from the operations (strictly intended) and in a way similar to the extra-managerial domains.

Framed through the DAS framework, the ex-ante pre-operational phase is provided by campus management to inform the following adaptive reuse operations and consists of the

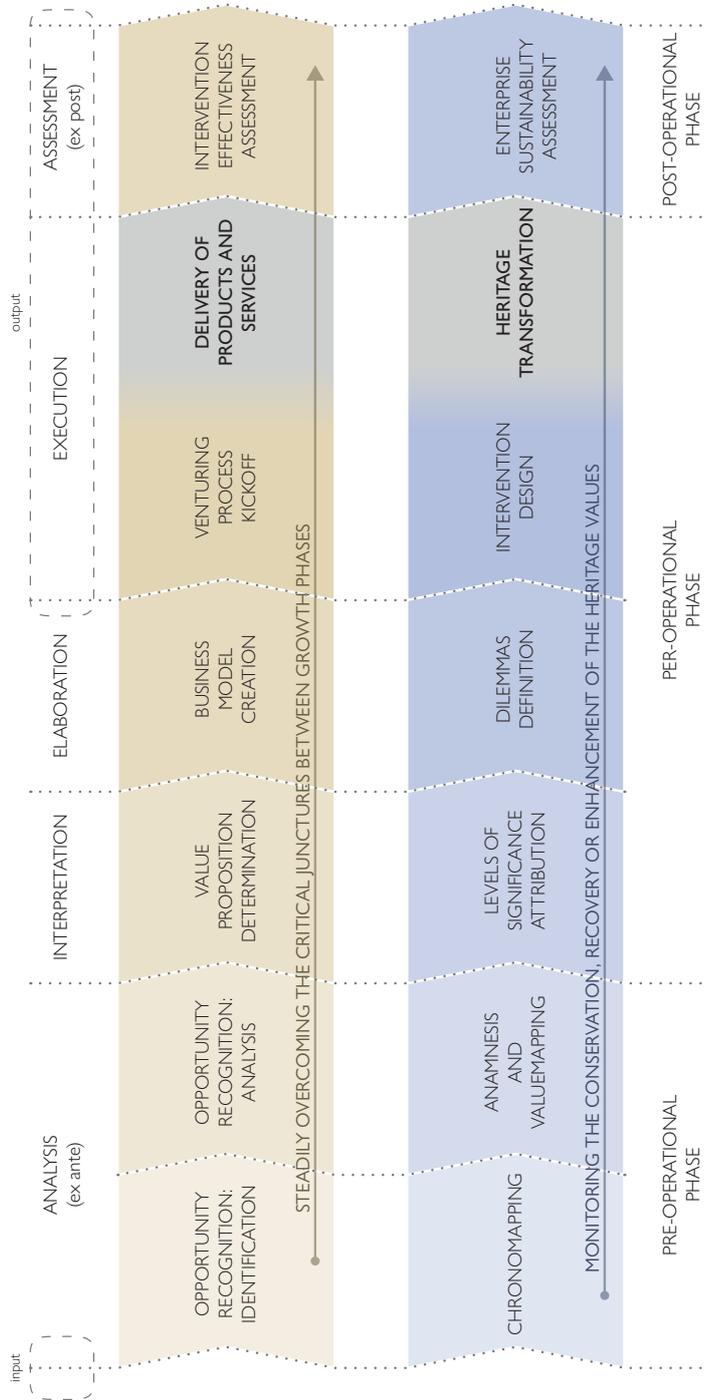


Fig. 13:
The parallel alignment between the two extra-managerial domains involved in adaptive reuse operations of dismissed historic campuses and their procedural and operational frameworks.

last two tasks of the full DAS cycle prior to the transformation. Specifically, the generation of future-proof solutions and the definition of the intervention strategies align with the procedures in the pre-operational phase of the extra-managerial domains by informing the operations through CREM/PREM variables (among which, most importantly KPIs regarding the four CREM/PREM perspectives and tasks). As these can be tailored upon the necessities of the two extra managerial domains, they represent to all extents and purposes the ideal inputs to be fed to the financial/entrepreneurial and architectural heritage procedural pipelines. Ex-post the operations, on the other hand, the post-operational phase is provided by campus management to feed the REM continuum with the adaptive reuse transformation outcomes. It consists of the first task of the DAS half-cycle following the operations, namely the assessing the current situation one, and is in line as well with the assessment procedures of the extra managerial domains. Nonetheless, assessing the outcomes of the adaptive reuse transformation through the CREM/PREM lens, it translates the outputs coming from the extra-managerial domains into CREM/PREM variables and KPIs, allowing to flawlessly pass the information on to the REM continuum without consistent losses.

As for the extra-managerial processes, campus management presents pre-operational and post-operational phases correspondently to the insertion of adaptive reuse operations in the REM continuum. These phases represent evident cue points on which to initially align and successively further synchronize the managerial domain with the extra-managerial ones. These correspondences also suggest the further presence of per-operational procedures in the managerial pipeline (analogously to the ones present in the financial/entrepreneurial and architectural heritage domains), which though are not to be found in this specific intervention domain. The lack of per-operational REM processes/procedures and of a pre-operational analysis procedure to introduce them is caused by the gap in the REM continuum that accommodates the extra-managerial domains involved in adaptive reuse operations. Because of this, the per-operational support and control performance demanded to the managerial domain is exclusively carried out by the indirect incorporation of the managerial control processes into the other intervention domains on KPIs defined on a standard predictive basis. As observed following previously illustrated analyses this greatly contributes to the loss of control over the operations, precluding their full-sustainability and preventing their realization. In absence of other elements, the most appropriate per-operational management processes and their procedural framework have to be determined following the propositions of the intended alternative operational model and within the limits represented by the DAS frameworks. Consequently, complementation of the pre-operational phase and the per-operational phase within the management domain should (1) consist of the processes within one or more full DAS cycles and/or DAS half-cycles to longitudinally reconnect the pre- and post-operational REM continuum. Additionally, (2) these processes should allow to be organized so to procedurally match the pre- and per-operational phases of the other extra-managerial domain pipelines parallelly aligned to the managerial domain itself, introducing a transversal cross-domain synchronization and consolidation criterion. Such guidelines direct to search for affinities between (a) the Assess-Explore-Generate-Define task recursiveness of the DAS framework and (b) the Analysis, Interpretation, Elaboration and Execution procedures missing in the managerial pre- and per-operational phases. For such purpose, the most fitting match is reached by a direct framing the four tasks of a full DAS cycle into the four missing

procedures within the managerial pipeline. Precisely, the assessment task starting the DAS cycle would constitute the *ex-ante* CREM/PREM analysis complementing the managerial pre-operational phase and allow to open the per-operational phase by enabling the procedure of interpretation through the exploration of the future demands. In the previously verified situation of a negative match between Future Demand and Current Supply, the elaboration would eventually consist of the generation of future-proof solutions and the consequent definition of the transformation strategies. This would finally flow into campus development by the execution of the adaptive reuse transformation, completing the procedural and operational frameworks of the managerial domain (fig. 14). In addition to cross-domain transversally synchronize at all times the procedures within adaptive reuse operations, the identification of the pre-/per-/post-operational campus management processes restores most part of the intra-operational REM continuum. Differently from what observed for the serially structured conventional operational model, in this one the continuum is in fact possibly interrupted exclusively by the execution of the transformations (fig. 15), still not negligible although less impacting.

The adaptations and the correspondences considered in these last two section partially contribute to answer the main research question (A – see section 1.4) posed to address the observed problem of loss of values. Specifically, the alignment of the extra-managerial domains and the successive adaptation of the campus management cyclical processes to their linearity contribute by concurrently answering to two sub-research questions (B1 and B3 – see section 1.4) relatively to their respective sub-problems.

4.3 Intra-procedural process consolidation: the structure of the integrated operational model

The possibility of framing the three intervention domains of adaptive reuse operations into the same operational and procedural frameworks finally enables to their full alignment into a parallel operational model. Though, while this makes clear what are the specific processes of each individual intervention domain that take place at each procedural phase, it still does not specify the internal order they follow and the reciprocal dynamics they establish. The need for such specification becomes crucial once considered that not only its lack could jeopardize the proper conduction of the procedures, but also eventually disrupt the entire adaptive reuse operations. In this perspective, the effectiveness and viability of the proposed parallelly organized operational model depends on the correct timing and connection among the processes within each procedure. The definition of these elements can be derived from the conventional structure of adaptive reuse operational models, hence indirectly from the nature of each of the involved domains. As previously observed (see section 3), the introduction of adaptive reuse operations in the REM continuum, the necessary managerial processes are fully executed before the ones required by the involved extra-managerial domains. This specific actuation order allows campus management to define and prepare the nature, the extents and the parameters of the adaptive reuse operations, to inform the other intervention domains, to forward them the most adequate control and support tools and to eventually feed the transformation outcomes into the following DAS cycle. Analogously, each individual stand-alone procedural phase couples extra-managerial processes that require to be informed, supported and

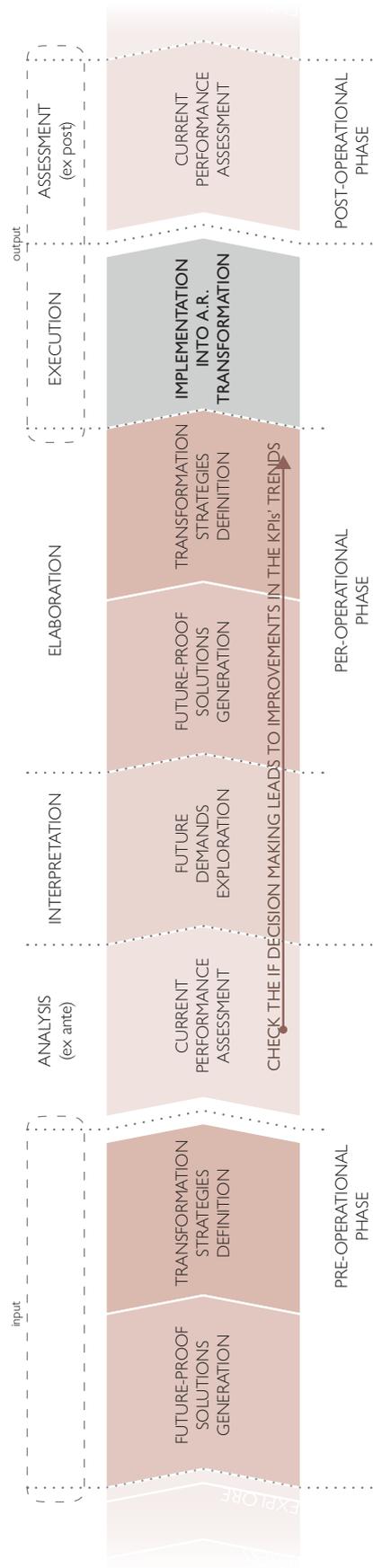


Fig. 14:
The operational and procedural organization of the managerial processes within adaptive reuse operations following the synchronization with the extra-managerial adaptive reuse intervention domains.

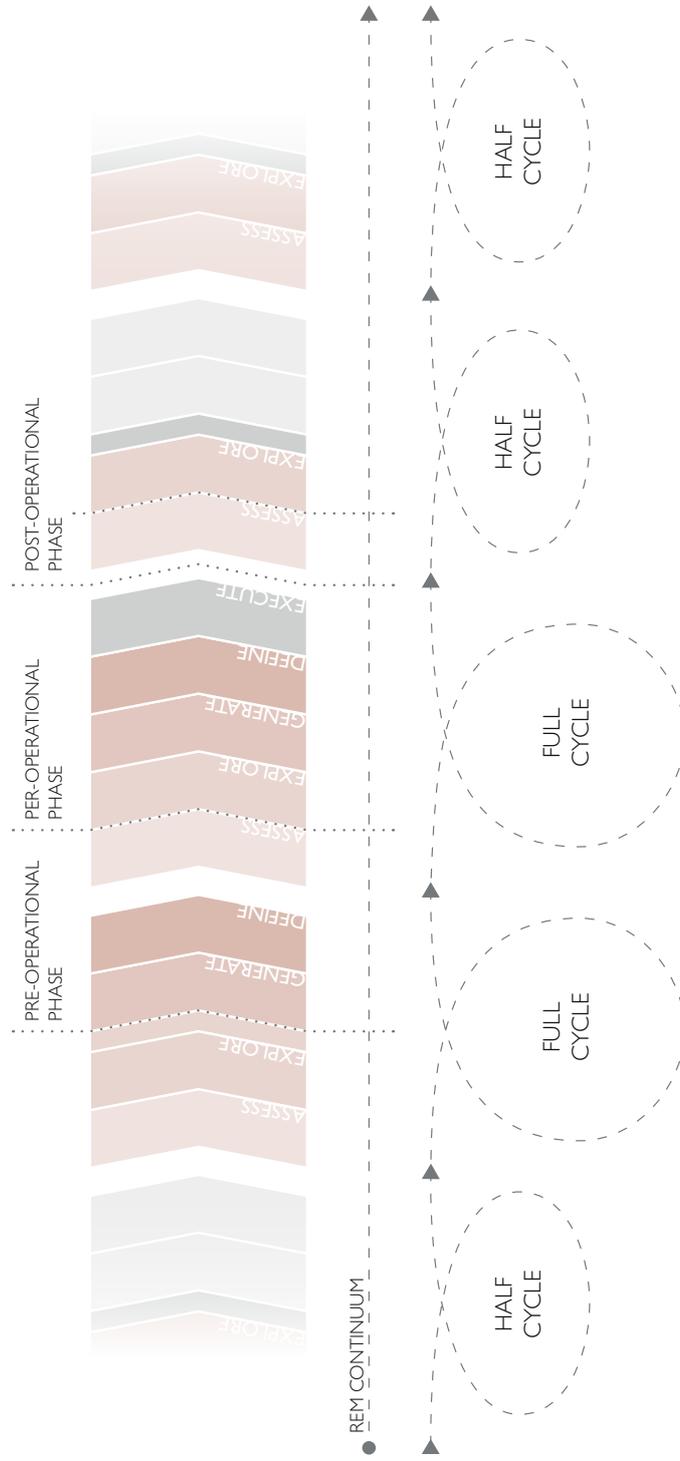


Fig. 15:
The DAS iterations constituting the REM continuum correspondently to adaptive reuse operations

assessed with an equivalent campus managerial one able to provide this performance. In this perspective, the execution of the managerial processes prior to the extra-managerial one can enable them to perform these tasks. Additionally, the extra-managerial processes can be executed simultaneously and before the closure of the managerial one because of the lower complexity of coordinating fewer dynamics and of the coherence among them. This allows a greater synchronization between the tasks and a higher information transfer efficiency, possibly leading to a greater phase-by-phase control of the entire adaptive reuse operations, eventually increasing their potential effectiveness. The resulting integrated operational model is characterized by the parallel execution of the three intervention domain, aligned to allow each campus management task to initiate its specific procedural phase, which is then fulfilled in concert with the extra-managerial domains (fig.16). Such configuration allows to reduce considerably the amount of discontinuities causing the value losses observed in the currently serially organized operational model. This is firstly achieved by the restoration of the REM continuum through the partial inclusion of the pre-intervention full DAS cycle and the post-intervention DAS half-cycle in the operations. Secondly, by the elimination of the gaps between the consecutive domains through their parallel execution. Lastly, by the pre-/per-/post-operational and procedural cross-domain alignment and to the resulting process synchronization, which enables a more coherent, coordinated and effective exchange of the required information at every stage of the intervention.

The process consolidation and the definition of the integrated structure of the possible alternative operational model strengthen the response of this research to the problem addressed by the previously answered sub-questions (B1 and B3 – see section 1.4) and provide a solution to the one still open (B2 – see section 1.4). Consequentially to all sub-questions of the research being answered, it is now possible to compose and consolidate their three individual responses to react to the observed main problem of the loss of values in reason of the main research question (A – see section 1.4).

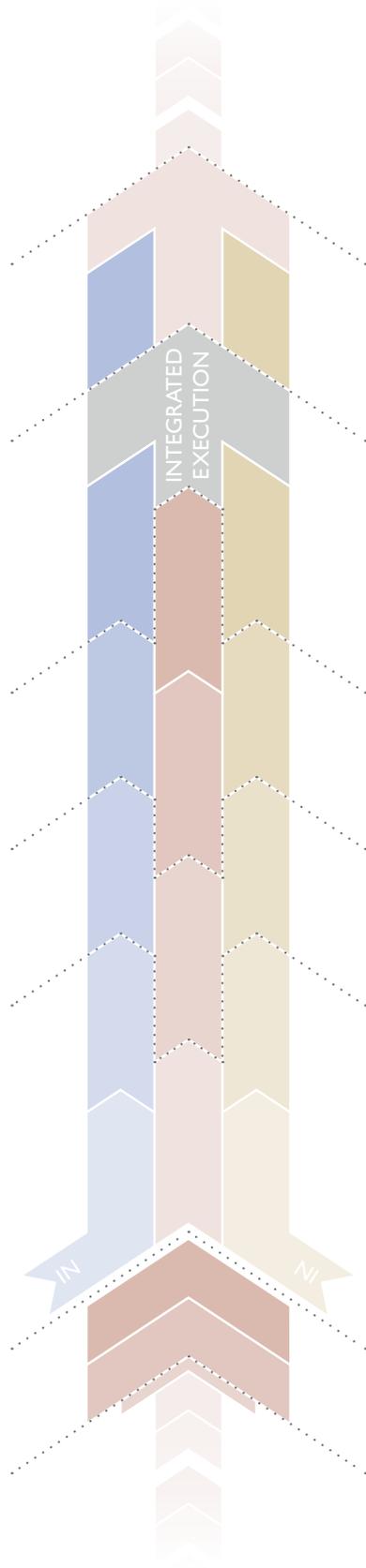


Fig. 16:
The structure of the integrated operational model inserted in the campus REM continuum. Each procedural phase is initiated through its campus management task before being fulfilled in concert with the extra-managerial domains.

5 THE CONDUCTION OF THE INTEGRATED OPERATIONAL MODEL

The parallel alignment of the intervention domains and the transversal synchronization of their procedures potentially allow the proposed integrated operational model to foster and successfully complete more fully-sustainable adaptive reuse transformations in dismissed enlisted campuses. However, the model enables to achieve this performance only by means of unprecedented levels of coordination between the different domains and of support and control to the operations at every step of their progression. Consequentially, the profitable employment of such operational model highly depends on the correct governance and conduction of its inherent processes. This is only obtainable through a comprehensive and deep understanding not only of the processes themselves, but also of the relationships that a so integrated model establishes between them and of the nature, quality and quantity of the information they exchange. Because of the simultaneity introduced among the processes within a same procedural phase, this is especially true for the newly introduced cross-domain synchronization dynamics. The conduction of the adaptive reuse operations, however, should not be entrusted to the subjects in charge of the campus management processes. Surely this would be the most immediate and intuitive solution because of their capability of managing and coordinating the four CREM perspectives. However, the complexity of such task and the full involvement of normally stand-alone extra-managerial intervention domains (fitted with their own process managers and process management tools) would cause an overflow of information, variables, stakeholders, tasks and interests to be considered. Eventually, this would not only prevent the possibility for them to apply their management criteria to the entire adaptive reuse operations, but also critically hamper their ability of conducting the processes pertaining to their own intervention domain . For this reason, campus management, financial/entrepreneurial and architectural heritage process managers should be exclusively appointed to pursue the

best possible governance of their own domains through their process management tools. Instead, the conduction of the adaptive reuse operations as a whole should be appointed to a separate and independent subject, which in close cooperation with the process owners of each domain can overview, coordinate and conduct the progression of the transformation. While allowing for a more efficient, autonomous and cooperative execution of the three intervention pipelines, the adoption of a similar organogram also enables the stakeholders involved in the adaptive reuse operations to intervene in its decision making processes as in Teisman (2002, 938–49). Such occurrence happens thanks to the interaction among the two hierarchic layers of the specific procedural and operational phases (Mintzberg, Raisinghani, and Théorêt 1976) and the three autonomous domain pipelines (or streams, as in Kingdon 1984), and allows the subjects appointed to the conduction of the operations to recur to multi-actor decision making frameworks to manage their processes and foster their progression (de Bruijn and ten Heuvelhof 2008).

5.1 Pre-operational phase conduction

5.1.1 Procedural input: generating, defining and forwarding the CREM/PREM operational input

In the recursiveness of the REM continuum, the verification of a mismatch between Future Demand and Current Supply scenarios prompts campus managers to proceed by executing the full DAS cycle instead of a routine DAS half-cycle. When the mismatch comprises the impossibility of maintaining the previous (or current) function and/or organization in a campus, the second half of the full DAS cycle generates future models and defines transformation projects including financial/entrepreneurial venture-oriented information. Analogously, it incorporates architectural heritage data in case the intervention targets an enlisted campus. When the three conditions are simultaneously met, the subjects appointed to the conduction of campus management processes prepare for the introduction of adaptive reuse operations into the REM continuum. In this occurrence, the second half of the pre-intervention full DAS cycle should then prepare the information so to be usable by the subject appointed to conduct the operations conductions to coordinate their processes. For this reason, while grounding their execution on the information coming from the pre-mismatch assessment of the current situation and exploration of the change in demands, they conform it to generate future-proof models in the perspective of a change of function/organization and of an intervention on an enlisted campus. On this, they then define the general but essential architectural, financial and managerial campus transformation elements (in the form of tasks, variables and KPIs for the four CREM/PREM perspectives) with the purpose of supplying the upcoming cross-domain transformation with the right operational input.

Generating future-proof campus models

The first process converging into the input of the adaptive reuse operations is the generation of future(-proof) campus models (third task of the pre-intervention full DAS cycle). In this process are evaluated the possible matches between prospective Future Demand and Future Supply scenarios while focusing the investigations on the hypothetic possible alternative campus development directions (conversions). For this specific purpose, the

match is searched throughout the all the scales at which real estate performance demand/supply dynamics take place between the campus and its stakeholders (den Heijer 2011, 175). This is done by relating the four territorial, district, building and place scales to their respective stakeholders, and by then determining and recognizing the demand for specific strategic goals, functions and users and for the availability of resources and the level of conceptual quality required (den Heijer 2011, 176). Because of the highest possible amount of support from existing and prospective stakeholders required by the interventions on dismissed enlisted architectural complexes, the considerations on Chapman (2006) by den Heijer (2011, 177–80) suggest to frame the generation of future(-proof) models for the campus within the “intellectual agora” scenario. Specifically, they point towards the establishment of collaboration relationships between the campus and its stakeholders on a regional scale and either competition or collaboration ones on a wider, global scale (see scenarios B1, B2 and B4 of table 6.2 in den Heijer 2011, 180). They additionally lead to create mutually-beneficial relations between the campuses and their cities (as in Worthington 2009), towards an efficient and adequate spatial and functional mix based on the parameters specific to the possible Future Demand – Future Supply scenario matches considered.

Defining transformation projects

The second process – the definition of the campus transformation projects – returns the actual operational input by composing a coherent and complete vision of the needed transformation with the most appropriate parameters determined by the previous process (for example methods, directions, objectives, goals etc.). The defined project vision, described through CREM/PREM tasks, variables, parameters and KPIs to, presents the specific characters of relevance/necessity and generality/predictiveness. The relevance/necessity character is required to feature the project definition exclusively with the elements actually required to preliminary and evenly inform the initial operations of the adaptive reuse transformations. The generality/predictiveness one is instead required to inform the operations with the direction and the broader limits to consider in the execution of their inherent processes. A so-defined transformation project assumes more managerial and programmatic traits, complementing otherwise markedly reactive transformation projects with a DAS-supported proactive characterization (den Heijer 2011, 203). From both the extra-managerial domains’ points of view, adaptive reuse transformations of dismissed historic architectural complexes represent inherently one-off, one-shot operations carried out to reactively address one or more connected wicked problems (Rittel and Webber 1973). As such, their CREM/PREM assessment can be only carried out empirically in the wider context of equivalent interventions on similar portfolios (Rittel and Webber 1973; den Heijer 2011, 204). The resulting information is however highly circumstantial and globally represent a poor database from which to derive proactively-approached project definitions based on predictive CREM/PREM scenarios. On the contrary, through the lenses of DAS-based campus management dynamics, adaptive reuse transformations do represent proactive campus development operations, predictively definable through the CREM/PREM variables derived from the previous DAS tasks. However, the extra-managerial components in the Future Demand and Supply scenarios exacerbate the anyway expected lack of managerial information up to neutralizing the effectiveness of exclusively proactively-approached transformations (den Heijer 2011, 204). In both perspectives, though,

the exclusion of the case-specific information relative to the empirical assessment and to the extra-managerial domains respectively leaves a core of shared CREM/PREM information. This can now be complemented reactively by the extra-managerial intervention domains and pro-actively by the DAS-based campus management processes, with the two approaches reciprocally filling the information gaps towards more complete and coherent transformation processes and outcomes (den Heijer 2011). In this sense, the integrated operational model plays a crucial part in allowing this complementation. Specifically, it provides the ex-ante analysis management process - the assessment of the current performance - with a project definition informed both proactively by the pre-intervention full DAS cycle and reactively by the first ex-ante analysis processes of the extra-managerial intervention domains (fig. 17). The initial definition of the approaches of each intervention domains to the definition of the transformation project also attributes them their own specific different roles in the entirety of adaptive reuse operations while prompting them to synchronously complement their processes.

The conduction of the integrated operational model

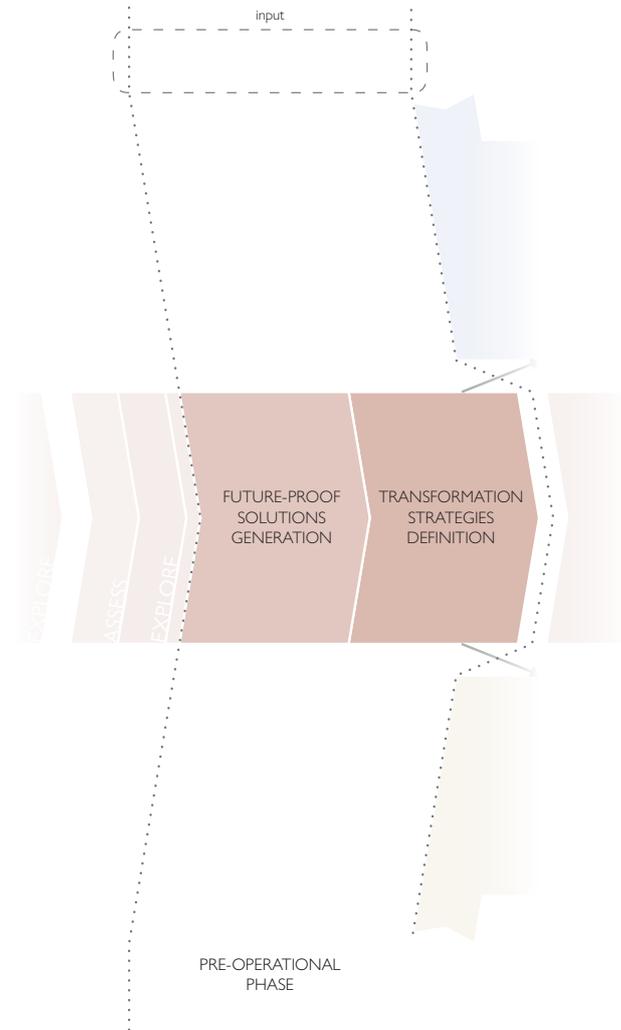


Fig. 17:
Full-detail scheme of the input managerial processes in the pre-operational phase of the integrated operational model.

5.1.2 Pre-operational phase: the ex-ante cross-domain analysis

The synchronous execution of the processes of the three intervention domains within adaptive reuse operations starts with the ex-ante analysis of the input channeled by the REM continuum through the pre-intervention full DAS cycle. This is described through necessary/relevant and general/predictive architectural, financial and managerial campus transformation guidelines (in the form of tasks, variables and KPIs and stakeholders for the four CREM/PREM perspectives). For the exclusive purpose of conducting the operations, such information can be initially provided through managerial tools that summarize the coordinates of the stakeholders' involvement, that frame the identified KPIs into the CREM/PREM perspectives and that compose an overview of the expected CREM/PREM transformation outcomes (see appendix B). These should be complete enough to inform the extra-managerial analysis processes with the transformation criteria inherent to the generated future-proof campus development model and clear enough to direct their enaction towards the defined transformation strategies.

Entrepreneurial opportunity recognition - identification

The financial/entrepreneurial ex-ante analysis procedure starts with the first process participating to the opportunity recognition: the opportunity identification. The opportunity identification process is identifiable in the “see” and “think” components of the opportunity recognition as organized through the OAC (Green 2015). By the recognition of certain entrepreneurial mindset/motivation/behavior elements, it successfully implements the CREM/PREM data in the analysis of the resources' availability, access criteria and alternatives exclusion (see bold elements in the Custom OAC, appendix C) while situating them in the wider frame of the macroeconomic change environment. The “think” component of the OAC is then completed internally to the process by recurring to external tools such as the PEST(LE) analysis (Gupta 2013 - which additionally prompts to the successive opportunity recognition process) and the consideration of Porter's 5 forces (Porter 2008). Finally, the semi-complete OAC is redirected into the campus management domain to complement the assessment of the current situation with the required financial/entrepreneurial data generated coherently with the previously identified CREM/PREM parameters (fig. 18).

Heritage chronomapping

The architectural heritage domain simultaneously begins the first architectural analysis process that can be preliminary initiated off-site: the chronomapping (Kuipers and de Jonge 2017, 73–74). The chronomapping of an enlisted campus should be carried out independently from any transformation strategy or purpose. However, the consideration of these elements can still be used to avoid the exclusion of otherwise negligible historic data and to gain further intervention-specific insights on the possible transformation directions contemplable. Defunctionalized enlisted architectural complexes, in fact, usually present an extensive documentation regarding the managerial and functional aspects related to its physical configuration. This can be used to verify, confirm, strengthen, update, modify and complement the otherwise exclusively general and predictive KPIs determined by the campus management processes. Additionally, it can corroborate their

historic relevance in the perspective of a more enhanced, respectful and coherent heritage transformation (Brand 1994; Allan 2012, 177; Spaan 2013; Meurs 2016; Kuipers and de Jonge 2017). The chronomapping is further completed following the on-site analysis of the heritage (which additionally prompts to the following architectural analysis process) and equipped with figures, schemes, drawings and diagrams useful for the divulgation of the report. It is then routed towards the managerial assessment of the current CREM/PREM related performance to update the campus management parameters with the relevant historic architectural information (fig. 18).

Current performance assessment

Gathering the partial completion of the OAC, the compilation of the chronomapping and in continuity with the pre-intervention full DAS cycle, the pre-operational campus management operations progress through the assessment of the current CREM/PREM performance in the light of the further information generated through the extra-managerial analysis processes. This process also incorporates the combined proactive/reactive transformation strategy previously defined to estimate the differential between the current available real estate performance and the expected final one, determining the required velocity of the development trend of the KPIs. Such comprehensive analysis based on surveyed adaptive reuse data (in analogy with den Heijer 2011, 128) and on more integrated campus profile variables (den Heijer 2011, 129–33) allows to conduct a more accurate performance assessment, leading to a more precise determination of the mismatch between the Current Supply and Current Demand scenarios (den Heijer 2011, 123). This also comes from a more reliable reconstruction of the Current Demand scenario, whose effects can be observed in the second (and final) analysis processes of the extra-managerial domains informed by campus management process (fig. 18). The heritage anamnesis and valuemapping and the entrepreneurial opportunity analysis can in fact be conducted in consideration of the detected mismatch, and better reflect it in the generation of their outcomes towards the following procedural phases.

Entrepreneurial opportunity recognition - analysis

Following the cross-domain analysis information elaboration and assessment conducted by the campus management through the first task of its intra-operational full DAS cycle, the financial/entrepreneurial domain continues its opportunity recognition with the opportunity analysis process. Resuming the compilation of the OAC, the relevant strategic and analytic tools and taking into account the Current Supply to Current Demand mismatch in the updated extended campus development variables, the opportunity recognition tackles the “act” components within the OAC (Gupta 2013; Green 2015). As this last *ex-ante* entrepreneurial analysis process furtherly introduces to the successive procedural phase, it employs additional tools to generate intrinsic entrepreneurial values and opportunities. In an innovation-oriented scenario and in continuity with the previous analyses, the determination of the “act entrepreneurially” components often require a SWOT analysis (or equivalent) and follows one or more optimization patterns (such as the blue ocean strategy by Kim and Mauborgne 2015). At its completion, the OAC returns an essential analysis of the entrepreneurial environment for the function/organization necessary to the adaptive reuse transformation, as well as the stakeholders, the support network,

the entrepreneurial opportunity and values substantiating it (Green 2015). Contributing to the initial definition of the entrepreneurial initiative, these same elements also allow to be steadily employed and iteratively reviewed in the following phases of the adaptive reuse operations and of the entrepreneurial venture itself. This happens consistently with the transformation and complies to the requirements set by the progression through the venture's growth stages, allowing to overcome the in between critical junctures (Vohora, Wright, and Lockett 2004; Khodaei et al. 2012). Ultimately, these elements constitute the necessary information to be forwarded to the following procedural phase of the operations, and while being at the base of the entrepreneurial value proposition determination it also contributes to the exploration of the Future Demand campus management scenario (fig. 18).

Heritage anamnesis and valuemapping

Simultaneously with the completion of the ex-ante analysis processes of the financial/entrepreneurial domain – and with analogous dynamics – the information generated by the assessment process of the managerial intervention domain is channeled towards the anamnesis and valuemapping process in the architectural heritage pipeline. In its first initial on-site phase, deducing the necessary elements from the completed chronomapping and including the managerial information (in the form of cross-domain CREM/PREM variables) in the evaluation of the campus, this process surveys the heritage with the objective of gathering the information required by and/or relevant to the transformation purposes (Kuipers and de Jonge 2017, 32–34). More specifically, while the chronomapping is carried on predominantly for the identification of the intrinsic and extrinsic values of the heritage (Riegl 1982; Orbaşlı 2008; ERA Architects 2011; Kuipers and de Jonge 2017 - see also appendix D), the anamnesis aims to define the relevance of the many different layers that can be considered in the evaluation of an architectural heritage (Brand 1994; Kuipers and de Jonge 2017 - see also appendix D). In a further off-site phase, in fact, the analysis reports generated by the processes within this intervention pipeline (consolidated by the cross-domain information synchronized through campus management processes) are used to compose the HVM (with reference to the Custom HVM in appendix D, configured on the specific case of dismissed historic campuses). In the HVM, the observed and lost heritage values are recognized, described, categorized and furtherly arranged in their respective scales, before being classified through an endangerment-based criterion organized on different levels (refer to the Custom HVM in appendix D). Such a cross-informed HVM is characterized by the ability of including a broader spectrum of information (in terms of nature, type and origin), regarding a greater amount of aspects and located in an extended set of scales still without losing its effectiveness or relevance. Concluding the analysis phase of the architectural heritage domain and representing for all extents and purposes a still image of the greater picture of the considered campus in its several wider context (including the managerial one), the HVM is the reference tool for the following processes within its domain and for the other ones from it directly informed. The clarity of the information framed in the HVM, its inclusiveness in regards to the analytical information coming from the others intervention domains (up to including the data coming from the opportunity identification) and its compatibility to the CREM/PREM campus management variables allow it to be transmitted as-is to the managerial and architectural

heritage processes pertaining to the interpretation phase of the adaptive reuse operations (fig. 18).

The correct and flawless execution of the processes taking part to the pre-operational phase of the adaptive reuse operations is crucial in the perspective of a real synchronization between the different intervention domains and of the alignment of their pipelines. Initializing the procedures of the financial/entrepreneurial and architectural heritage domains, their enaction and coordination represents an intense task to be carried out by the subject appointed to the conduction of the adaptive reuse operational model. For this reason, each of them comes equipped with existing (or new) structured overview tools that facilitate their steady control, support and cross-information, and allow them to communicate their progresses and findings between each other. Specifically, the architectural heritage domain generates a chronomapping report and an anamnesis report which eventually combines and summarizes in a matrix – the HVM – that contains the necessary and relevant data to the other domains and to the further processes within its pipeline (see appendix D). The financial/entrepreneurial pipeline, analogously, composes the OAC to prepare a venturing ground for the prospective function/organization to be instated through the adaptive reuse transformation (see appendix C). The managerial domain, however, does not return any fixed canvas, or matrix, or report. Instead, it provides full coordination of the involved stakeholders, of their interests and of the related real estate tasks and KPIs and connects them to the relevant CREM/PREM perspectives throughout the progression of the DAS tasks. This coordination and support role can be facilitated by the use of tables, frames and charts that, as a buffer, gather and redistribute constantly the data and the updates coming from the pre-intervention full DAS cycle and from the extra-managerial intervention domains. To summarize, structure, overview and control the managerial information, this research proposes three partially overlapping tools displaying the correlations among specific selected sub-sets within the whole set of the adaptive reuse necessary managerial variables (see appendix B). All these documents and tools, once completed, can be furtherly brought to the following per-operational phase of the adaptive reuse transformations, and used either as a reminder of the outcomes from the per-operational phase or as elements on which to draft the successive processes and their relative tools.

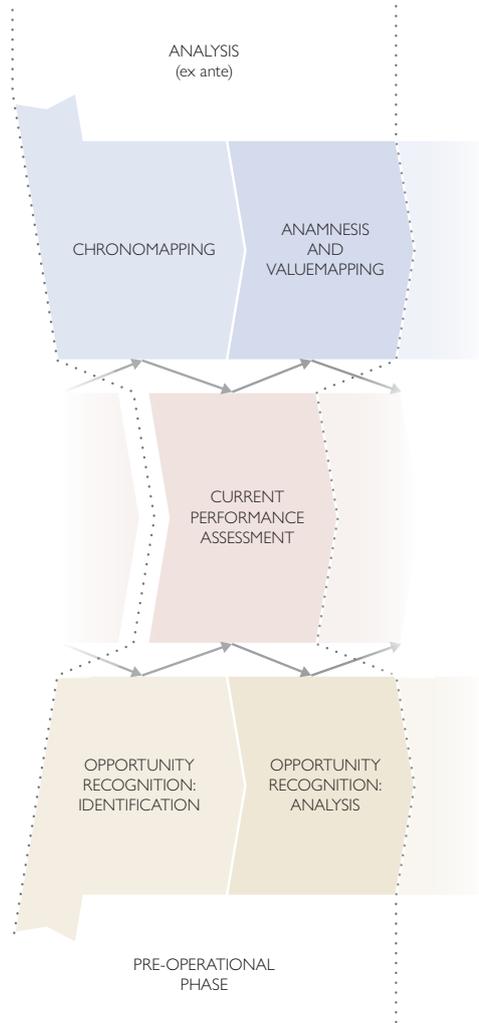


Fig. 18:
Full-detail scheme of the analysis procedural phase in the pre-operations of the integrated operational model.

5.2 Per-operational conduction

5.2.1 a cross-domain interpretation towards a transformation direction

The completion of the pre-operational phase prompts the conductor of the integrated operational model to the per-operational phase of the adaptive reuse transformation. Differently from the precedent one, the per-operational phase is characterized by a full level of project-specificity in the processes of the three intervention domains. This progression criterion is specifically introduced in the operations by the cross-domain procedural phase of the interpretation. To this purpose, the processes within the interpretation procedure receive the data generated by the ex-ante analysis processes and employs it to delineate a clear and precise transformation direction among the possible scenarios within the previously defined project vision.

Future demands exploration

The procedural phase of interpretation starts by progressing the campus management processes through the exploration of the changing demand between the Current Demand and Future Demand scenarios. In ordinary REM operations, this particular task fulfill a three-fold performance critically important to the campus development continuum (see den Heijer 2011, 124). From a purely interventive perspective, its correct execution is fundamental to the (non) verification of the future match between the Current Supply and the Future Demand scenarios, which in turn substantiates the decision-making process regarding portfolio transformations. While not having this particular influence on the “if” of adaptive reuse transformations, the exploration of the future demand still has a crucial role on the “how” matters. This process fulfills such important task by gating, crossing and controlling the cross-domain information of the extra-managerial interpretation processes by the entirety of the pre-operational phase (fig. 19). Receiving the outcomes of the ex-ante analyses through the entrepreneurial OAC, the architectural HVM and the previous DAS-based campus management tasks, the changing demand exploration investigates on the range of the possibly undertakable project directions and describes them in the previously identified CREM/PREM tasks, variables and parameters. Successively, it uses this data to compile lists of programmatic requirements respondent (on one side) to the previously investigated current match and (to the other) to the eventual future demand scenarios backable by the extra-managerial intervention domains (den Heijer 2011). Once generated, the lists are used to update the management tools available to the operational model conductor, which in concert with the process/project managers of the three intervention domains defines a clear and precise direction for the adaptive reuse transformations. In doing so, the campus managers exclude from the REM discourse the CREM/PREM variables, tasks and parameters no more relevant to the transformation purposes and return a leaner version of the management tools to the integrated operational model coordinator. The tools are successively forwarded to the extra-managerial interpretation processes to inform them on the specific managerial goals that the adaptive reuse interventions should achieve to be able to support the prosecution of the operations and to ensure a more fully-sustainable transformation in respect to the four CREM/PREM perspectives (fig. 19).

Value propositions determination

After having taken part in defining the direction of the adaptive reuse intervention, the entrepreneurial domain retrieves the renewed managerial CREM/PREM overviews to incorporate the relevant parameters and tasks in its venture journey. Analogously to what occurred within the managerial pipeline, the entrepreneurial domain cross-checks that information with the OAC inherited from the opportunity recognition processes, obtaining a leaner and destructured version of the OAC. This temporary document is characterized by a specific data consistency in correspondence with the “see” and “act” components of the OAC, particularly relevant in respect to the stakeholders in the network of support, their interests and deterrents and their tasks (relatively to the performance obtainable from the campus) in a Current Supply – Current/Future Demand perspective. At this moment, it constitutes to all extents and purposes the exact entrepreneurial analogous of the managerial process within the interpretation procedure. The data is then used to determine the value proposition that the new function/organization, the corresponding campus development and the architectural transformation can provide to their stakeholders. The value proposition determination process is facilitated in the task of precisely composing and determining the value determination by the VPC (Osterwalder et al. 2014). In the VPC the relevant parameters relative to the stakeholders in the considered support network(s) (divided in gains/interests, pains/deterrents and jobs/tasks) are related to the respective value elements brought by their domain-specific interventions into the adaptive reuse transformation (gain creators, pain relievers and the products-services-values-performances mix). To comply with its support role to the whole adaptive reuse operations (and transformation), the value proposition is determined for the three transformation pipelines rather than exclusively for the entrepreneurial one (see appendix C). In this sense, the greater value proposition pushed by the transformation as a whole is more intuitively drafted through a triple-layered VPC targeting coordinately and coherently the stakeholders of the three intervention domains separately. Once completed jointly with the other intervention domains, the triple-layered VPC is forwarded to the managerial and financial/entrepreneurial processes of the following procedural phase (fig. 19).

Attribution of the levels of significance to the heritage values

Once deliberated on the direction of the adaptive reuse intervention and simultaneously to the value proposition determination, the architectural domain carries on its interpretation phase by attributing the levels of significance to the values mapped in the HVM (Kuipers and de Jonge 2017). This process is based on drafting a second, purpose-specific value matrix – the HSM (see appendix D) – which, top of the original HVM, categorizes the values reflect their relevance in respect to several aspects. The primary criterion is independent from the transformation purposes and is based on the significance of each value considered in the wider contexts of its scale, its campus, its architectural type and finally its own nature as a stand-alone heritage trait. The other relevance criteria are instead strictly related to the characteristics of the planned transformation. Introduced in this very same process, the first is the pertinency and significance of each value in respect of the defined transformation direction. The second instead, due to the occurrence of the heritage intervention in a context of adaptive reuse transformation, is the role of the value in reaching the objectives defined by campus management in a Current Demand – Future

demand perspective (in form of CREM/PREM parameters and variables). Analogously to process of composition of the VPC from the complementation between the OAC and the campus management processes, the HSM represents the middle ground between the initial opportunity represented by the heritage (mapped in the HVM) and the architectural and managerial requirements coming from the interpretation of the analysis into a defined transformation direction. At its completion, the visual comparison between the HSM and the HVM returns an essential, but intuitive and relevant overview of the heritage in regard to the current and past scenarios (HVM) and in regard to the current and future scenarios in a campus development perspective (HSM). These two matrixes are then forwarded to the architectural and managerial and architectural heritage processes of the following procedural phase (fig. 19).

The interpretation phase represents so far the first truly completely synchronized procedure in which the three intervention domains, coordinately, collaborate to define the managerial, financial/entrepreneurial and architectural heritage elements required for a successful, fully-sustainable adaptive reuse transformation of the dismissed historic campus. These elements, determined by each domain in its specific (but shareable) terms, constitute a consistent, solid, and descriptive program on which to found their further operations and their specific intervention project. Considered in the total, cross-domain and broad-spectrum transformation, the sum of the triple-layered VPC, the HSM and of the CREM/PREM variables constitute the complete but essential picture on which to base the remainder of the procedural phases, to which they are channeled through direct and cross-information dynamics.

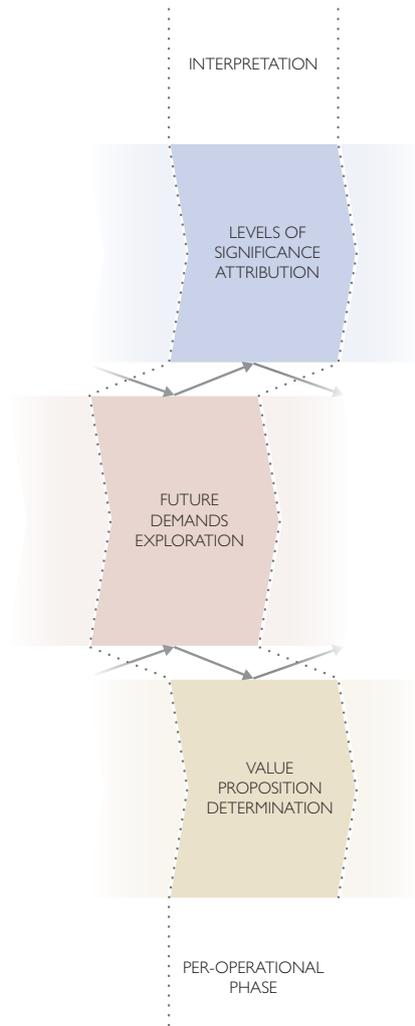


Fig. 19:
Full-detail scheme of the interpretation procedural phase in the per-operations of
the integrated operational model.

5.2.2 a cross-domain elaboration towards the transformation definition

The redaction of the HSM and of the VPCs and the updated CREM/PREM variables, tasks, KPIs and parameters completes the procedural interpretation phase necessary to carry on the processes inherent to the per-operational elaboration of the adaptive reuse transformation. In this procedural phase, the previously defined project direction is developed into a complete and integrated transformation process in managerial, entrepreneurial and architectural terms. Being carried out preliminarily to the execution phase and directly introducing to the outputs of the integrated operational model, its main role is to finalize all the elements (processes, procedures, information, tasks etc.) necessary to allow the activation of the transformation's support networks of stakeholders.

Future-proof solutions generation

The future-proof solutions generation process inaugurates the elaboration phase and continues the intra-operational DAS cycle execution. The enaction of this specific third DAS task at this phase of the operations presents two major analogies with other management processes previously incorporated in the integrated operational model. The first analogy interests the third DAS task within the pre-operational full DAS cycle and involves the core activity of these processes: matching the Future Demand and the Future Supply scenarios. To that purpose, both tasks search for the match throughout all the (four) scales presenting real estate dynamics and frame them within the “intellectual agora” model by (preferably) collaborative regional and global stakeholder networks (see section 5.1 and den Heijer 2011, 175–80). Unlike the pre-operational process however, the per-operational one does not predictively search and identify possible demand/supply relationships and possible stakeholders. Instead, it incorporates the CREM/PREM variables, parameters, KPIs, tasks and stakeholders determined during the intra-operational campus management progression and finally generates the most adequate and respondent future-proof solution based on the adopted future campus model and compliant to the determined project direction. The second analogy is with the previous future demands exploration managerial process (see section 5.3) and regards the role of the process within its procedural phase. Both the processes in fact gate, cross and control the cross-domain information transfers between the entirety of the extra-managerial intervention processes within their own procedural phases. The generation of future-proof solutions, however, progresses in such role by further shifting the matters from the “hows” to the “whats”, in the perspective of detailing and perfecting the managerial configuration of the transformation in a campus development perspective (see section 5.3 and den Heijer 2011). Additionally, the solution generated by this process (in terms of CREM/PREM variables and parameters) are directly forwarded to the last pre-execution processes of the three intervention domains (fig. 20). For this reason, the managerial overview tools available to the operational model conductor are in this process completed and finalized and are susceptible to minor corrections and implementations exclusively when strictly necessary.

Creation of the business models

The second process taking place in the procedural elaboration phase is the business model creation by the financial/entrepreneurial domain. This specific phase of the

entrepreneurial journey assembles and finalizes the support structure, the activities and the operations that allow the functional/organizational venture within adaptive reuse transformations to sustain the interventions up to the achievement of the final sustainability stage (Vohora, Wright, and Lockett 2004; Osterwalder and Pigneur 2010; Teece 2010; Khodaei et al. 2012). For such task, the information derivable from the OAC and from the newly generated future-proof managerial solution result essential in enabling the venture to autonomously overcome the successive critical junctures (Worthington 2009) also through the (now possible) real-life application of the entrepreneurial mindset-motivation-behavior components from the “think” part of the opportunity analysis (Green 2015). That information is specifically implemented in the creation of the business model by the use of the BMC (Osterwalder and Pigneur 2010). Specifically, the BMC integrates fully the VPC in its sectors 1 and 2 (see appendix C). The sectors 3-9 are instead compiled in consideration of the CREM/PREM parameters and variables relative to the REM future-proof solution generation and of the information already framed in the OAC (see appendix C and Osterwalder and Pigneur 2010; Teece 2010; Gassmann, Frankenberger, and Csik 2014). Consequentially to the transformation value proposition being constituted by three domain-specific interlinked value propositions (summarized in a triple-layered VPC), the transformation BMC can also be split in three connected domain-specific BMCs. In this way, each individual business model can be better fitted to the different purposes, dynamics, necessities, characteristics and operations of each individual pipeline and of the related stakeholders. A similar three-fold organization between business models can be used in the design of more environmentally and socially aware businesses (Joyce and Paquin 2016). Other than considering factors not strictly belonging to the entrepreneurial aspect of a business, this BMC structure introduces two verification criteria : the “horizontal coherence” given by each BMC individually per analyzed field and “vertical coherence” (given by the cross-information between the same sectors among the three BMCs (in reference to Joyce and Paquin 2016, 1482 fig. 4). Needless to say, because of the parallel alignment of the three adaptive reuse intervention domains, of the coherence of the information they exchange and of the procedural synchronization among the processes, these criteria are also observed among the BMCs within adaptive reuse operations. Their presence within this procedural phase provides additional bond among the three intervention domains in the complex situation of a joint transformation elaboration. At their completion (achieved in collaboration with the other domains), the three BMCs are channeled from the entrepreneurial domain to the campus management pipeline to contribute in the creation of the most appropriate and effective transformation strategies. Additionally, they are fed into the entrepreneurial execution procedural phase, ready to be enacted at the conclusion of the transformation elaboration (fig. 20).

Definition of the design dilemmas

The third process participating to the adaptive reuse transformation elaboration is the definition of dilemmas within the architectural heritage domain, which operates simultaneously to the entrepreneurial creation of the three domain specific BMCs. This process makes full use of both the HVM and the HSM at the same time to define the transformation approach to the heritage and the possible themes of the project within the previously planned direction. For this, it employs the future-proof solution generated by the managerial information as a reading key, complementary to the architectural one, in the choice

and elaboration of the dilemmas regarding the heritage transformations. This elaboration is conducted through an iterative series of different operations involving the HVM and the HSM, backed up (if and when necessary) by the chronomapping and anamnesis reports (Kuipers and de Jonge 2017, 95–97). These operations normally include the confrontation between the risk and the significance of the values, their qualitative and quantitative estimation, the evaluation of the relevance for the managerial, entrepreneurial and architectural programs, their perfection or their union into coherent groups etc. Such operations are finalized to the selection and elaboration on the preservation, restoration, recovery or enhancement of one or more (groups) of heritage values, by means of interventions usually either in harmony or in opposition with them (Kuipers and de Jonge 2017). To this purpose, the values are grouped into multi-value-driven design themes connecting the values throughout the different scales of the architecture. Dependently on their localization and on the value they comprise, these themes are usually active either transversally on the intrinsic and/or extrinsic values in a singular (or adjacent) scale(s) of the architecture. Vice versa, they can be present transversally at many scales of the architecture (up to connecting the site to the stuff) but in the exclusive intrinsic or extrinsic categories of architectural values. While primarily drafted into a preliminary design report describing the “hows” the “whys” and the “whats” of the operated choices, these processes and their results can be visualized on a third, final matrix again based on the original HVM of the campus. This further matrix, the DTM, summarizes and gathers all the relevant heritage design data to be shared with the other intervention domains preliminarily to the execution of the transformation. Before being forwarded to the heritage executive processes and used by the operational model conductor as a heritage transformation control tool, the DTM is given back to the final campus management task of the per-operational phase (fig. 20).

Transformation strategy definition

The fourth and final process active in the elaboration phase within adaptive reuse operations is also the fourth and last task of the intra-operational full DAS campus management cycle, as well as of the REM continuum preceding the gap due to the execution of the adaptive reuse transformation. This last transformation strategy definition process collects, coordinates and verifies in ultimate stance the entirety of the cross-domain and managerial information so far generated by the adaptive reuse operations. From an operational point of view, it performs this task towards the finalization of the pre-intervention processes and of the transmission of the integrated project to the ones dedicated to the material execution of the adaptive reuse transformation. From a managerial point of view, instead, it allows to prompt to the execution phase a final transformation strategy characterized by a prevalent proactive (rather than reactive) definition of the intervention. Although fulfilling the same purposes of its twin pre-operational DAS task (see section 5.1), its goal differs because of the opposite characteristics that its CREM/PREM tasks, variables, parameters and KPIs present. In the light of the operations conducted by the three parallel intervention domains and of the required transformation definition, they are extensive/complete and specific/actual rather than relevant/necessary and general/predictive. The alignment and synchronization of the extra-managerial domain to a mediating intra-operational campus management DAS cycle in fact, finally result in a nearly total neutralization of the reactive character of one-off, one-shot entrepreneurial

ventures and heritage transformations (see section 5.1). As a consequence, the integrated operational model generates sufficient CREM/PREM information transversally coherent among the intervention domains, which enables a completely proactive approach to the transformation definition, desirable in these particularly complex circumstances (den Heijer 2011, 203–6). In this way, the transformation strategy definition can present a deep level of programmatic detail, comparable to certain extents to the one obtainable from the application of standard project and process management frameworks to portfolio interventions in ordinary circumstances (Project Management Institute 2017). Such detailing is operationally reflected by the possibility of forwarding to the execution phase a transformation strategy structured in synchronous architectural, entrepreneurial and managerial partial intervals, much less limited in time by the limits imposed by an inherently one-shot operation (Rittel and Webber 1973; Vohora, Wright, and Lockett 2004). In conclusion to the elaboration procedural phase, the transformation strategy brief and its complete CREM/PREM coordinates are transmitted to every process of every domain involved in the final per-operative execution procedures (fig. 20).

The conduction of the integrated operational model

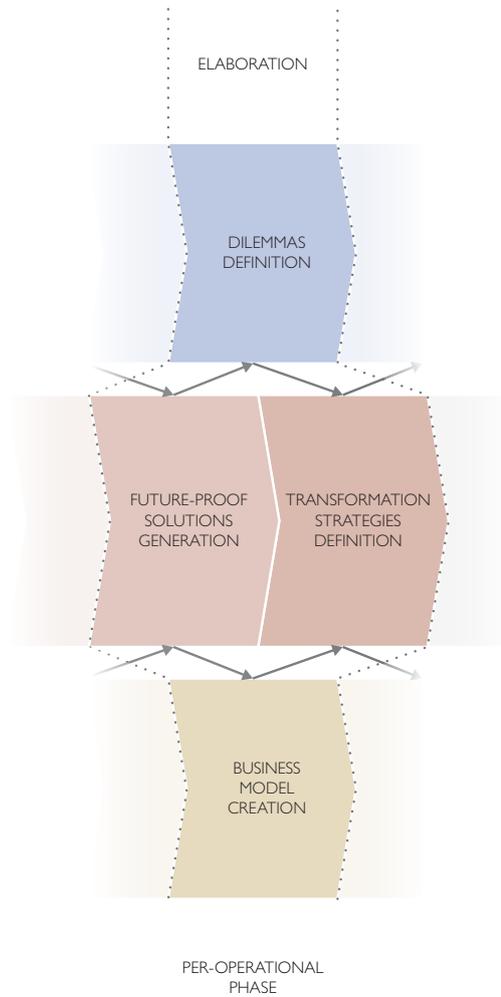


Fig. 20:
Full-detail scheme of the elaboration procedural phase in the per-operations of the integrated operational model.

5.2.3 the integrated project execution as a tangible output

The execution of the integrated project of adaptive reuse transformation is, at the same time, the last procedural phase of the adaptive reuse operations (strictly intended) and the first component of the operations output. In a procedural and chronological progression, its inner processes collect the finalized information on the transformation from the three intervention domains and translate and translate it in a factual project, before finally proceed to the concretization of the integrated intervention. In these regards, the purpose of the execution procedure is to realize the planned integrated adaptive reuse transformation in broader terms than immediate architectural, managerial and entrepreneurial ones. Such wider extents include for example activating the dynamics involved third parties, opening of the resources channels and guiding the establishment of the planned activities. Because of these dynamics, the procedural execution phase is inherently complex and requires an ever greater level of cross-domain coordination (hence support and control) than in the previous phases of the operations. To this purpose, campus management is required to fully assist the conduction of the operations throughout the whole procedure, by mediating the complementation and consolidation of the financial/entrepreneurial and architectural heritage processes in one through means of CREM/PREM parameters and variables (fig. 21). Differently from the previous ones, the multiplicity of the process resulting from this combination and its high internal dynamism do not allow to frame it in a structure through which describe and possibly conduct it. However, the control of this processes can be approached through a different, more fluid perspective, practicable because of the attained completeness of the architectural heritage, campus management and financial/entrepreneurial domains toolsets and in function of the clarity of the expected transformation outcomes. This case-specific coordination method hierarchizes the multitude of individual elements and dynamics necessary to the transformation completion in a chronological, consequential actuation sequence, whose is specifically designated to the exhaustion of the extra-managerial processes and to the reintroduction of the transformation into the campus management continuum. In consideration of the risk attached to the hypothetical duration of the interventions, to the amount of required resources and to the availability of stakeholders, the sequence should be phased into smaller autonomous operations in the perspective of being carried on as an incremental transformation process.

Other than a greater control over the risk attached to the adaptive reuse transformations due to the mitigation of their one-shot character (Rittel and Webber 1973; den Heijer 2011), their phased incremental execution entails several other contributions to their full-sustainability and success rate. In a first place, it reduces the overall complexity of the transformation by dividing it in more controllable, purpose-specific operations. In a second place, it strengthens their future-proof character by allowing more room for adjustments and tolerance for ambiguity (at specified intervals). In a third place, it allows to untie the transformation success to the mutability of the boundary conditions by interrupting and resuming the operations (only if needed and also at specified intervals). In a fourth place, it leads to more balanced and stable results by the controlled and gradual introduction of the transformation's stakeholders. In a fifth place, it enables feedback dynamics by the intersection and partial overlap of the intervention phases. In a seventh place, it increases the project sustainability by allowing more stakeholder-dedicated processes and steady evaluations. In an eight place it gradually returns the campus dynamic to

the managerial domain by steadily completing the extra-managerial processes. In a ninth place reduces the gap in the REM continuum by increasing the contact points between pre- and post-transformation conditions. Last but not the least, in a tenth place, it best integrates in the execution processes the architectural heritage and financial entrepreneurial execution processes – the intervention design and the venturing process kickoff – by supporting the ones iterative dynamics within their operations and relating them to the recursiveness of DAS-based campus management. This final point particularly well suits the entrepreneurial venturing process kickoff process, whose specificity consists in recursively updating its business model (also dependently on mutations in the “see” part of the OAC) and in progressing the business growth stages through iterations of the venturing journey (Vohora, Wright, and Lockett 2004; Osterwalder and Pigneur 2010; Green 2015). To reach the final, sustainability stage of its entrepreneurial journey, any venture has in fact to overcome four specific critical junctures, achievable only through the steady debrief of the phases between which they are situated (Vohora, Wright, and Lockett 2004, 152). Once that the transformation (or the transformation phase) is completed, the execution output is forwarded to the post-operational phase of the interventions, in order to be globally assessed and to be integrated into the campus management continuum.

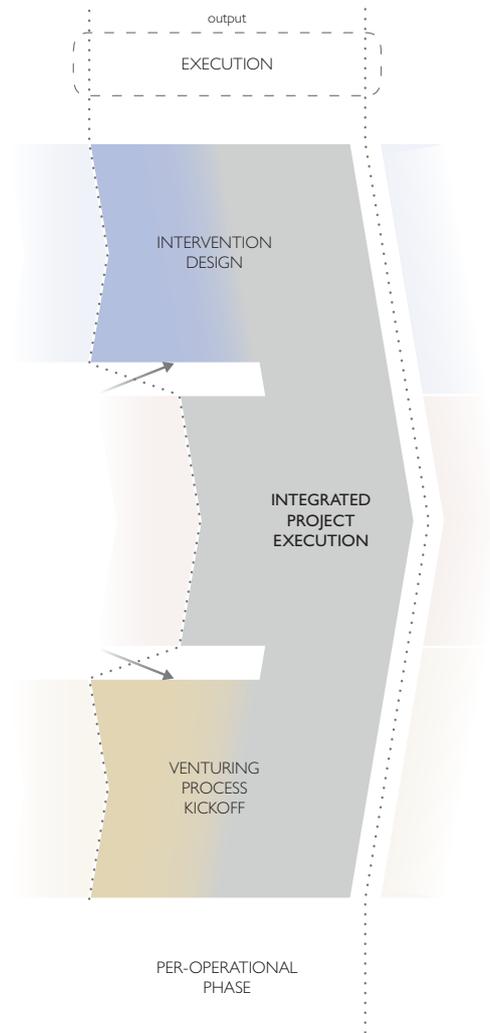


Fig. 21:
Full-detail scheme of the execution procedural phase in the per-operations of the integrated operational model, with a particular focus on the consolidation of the operational pipelines.

5.3 Post-operational conduction

- 5.3.1 the assessment of the adaptive reuse operations, of their full sustainability and of their transversal value outcomes

Managerial assessment

At the completion of the pre-operational phase of the integrated model through the execution of the planned transformation (or of a transformation phase), the three intervention domains temporarily cease to actively participate in the campus development processes. In doing so, the extra-managerial domains prepare to leave the operations and separate from each other, while the managerial domain arranges the integration of the transformation in the campus development progression by restoring the DAS-based REM continuum. Through the first assessment task of the following DAS half-cycle, campus management complements the outcomes of the per-operational execution phase and composes a CREM/PREM picture of the campus ex-post the adaptive reuse transformation (refer to section 5.2 and to den Heijer 2011). In this occasion, campus management resumes the financial/entrepreneurial and architectural heritage information generated in the integrated operational model to execute a cross-informed, multi-domain, broad-spectrum coordinated assessment before the complete detachment of the two extra managerial domains (fig. 22). In this procedural phase, the three domains contribute with their own assessment methods and criteria to the generation of reports - in their own variables and parameters - regarding their performance, with a special consideration of their contribution to the transformation full-sustainability and to its success in respect to the S.M.A.R.T. elements defined throughout the pre- and per-operations (Doran 1981). Nonetheless, the inclusion of the assessment processes of the three domains in the integrated operational model for adaptive reuse provides them with additional criteria and tools that, combined with the ones inherent to the intervention domain itself, return a more coherent and comprehensive estimation of the transformation's effectiveness. These reports are ultimately incorporated by the managerial domain in a comprehensive and extensive CREM/PREM based assessment regarding the match between the new Current Supply and Current Demand scenarios.

Architectural heritage assessment

The heritage domain bases the assessment of its operations on several interdependent criteria (fig. 22). Primarily, it verifies that the values and the authenticity of the heritage have not been further threatened or damaged by the transformation independently to the undertaken direction. Secondly, it estimates the degrees up to which they have been recovered, preserved or enhanced by the adaptive reuse transformation. Thirdly, it checks on the recognizability of the design themes and on the clarity of the decisions concerning the heritage dilemmas. Fourthly, it checks on the correct delivery of its value proposition to the identified stakeholders, and on its implementation in its business model. Fifthly it examines the enabling role of the transformation in regard to the business model itself. The architectural heritage processes and project managers and the operational model supervisor can recur to the domain's specific adaptive reuse toolset to be facilitated in these tasks.

Financial/entrepreneurial assessment

An analogous use of the domain's toolset can be done by the entrepreneurial domain managers to verify the correct delivery of the entrepreneurial venture's value proposition to its specific stakeholders and its integration in the domain's business model. This verification should be coupled to the examination of the operations of the newly instated organization/function, to confirm the absence of bottlenecks or dead-ends in the execution of its business model. This analysis should also verify the correct supply of products and services and the generation of turnover to be eventually reinvested to sustain and foster the campus development operations (fig. 22). An additional assessment criterion available to the financial/entrepreneurial domain is the confirmation of the reaching of the sustainability phase through the monitored overcome of all the venture's critical junctures. At this stage, however, it has to be evaluated the venture's level of retention of the entrepreneurial mindset, motivations and behaviors as included in the OAC. In harmony with the two extra-managerial post-operational assessment processes, the managerial domain audits the increase in the performance that the campus provides through the CREM/PREM perspectives to its stakeholders, to the heritage and the society and to its organization and users. That should further substantiate the meeting of the stakeholders demands and the pursue of their interest through the CREM/PREM tasks. At the same time, campus managers attest that the trends defined for each specific KPI has been reached. Such assessment tasks should be aimed to the attainment of the full, cross-domain sustainability of the intervention and to its ability in anticipating the future match of the upcoming DAS managerial cycle, ultimate manifestation of its success. Once verified the achievement of the goals set at the definition of the adaptive reuse transformation (see section 5.4), the managerial domain collects the joint assessment of the three processes and expresses it in CREM/PREM parameters, variables and KPIs to be forwarded to the information management workflow of the post-transformation REM continuum (fig. 22).

The conduction of the integrated operational model



Fig. 22:
Full-detail scheme of the ex-post assessment procedural phase and of the complementation of the adaptive reuse output in the post-operations of the integrated operational model. The scheme also shows the completion of the extra-managerial processes and the reinstatement of the campus management REM continuum.

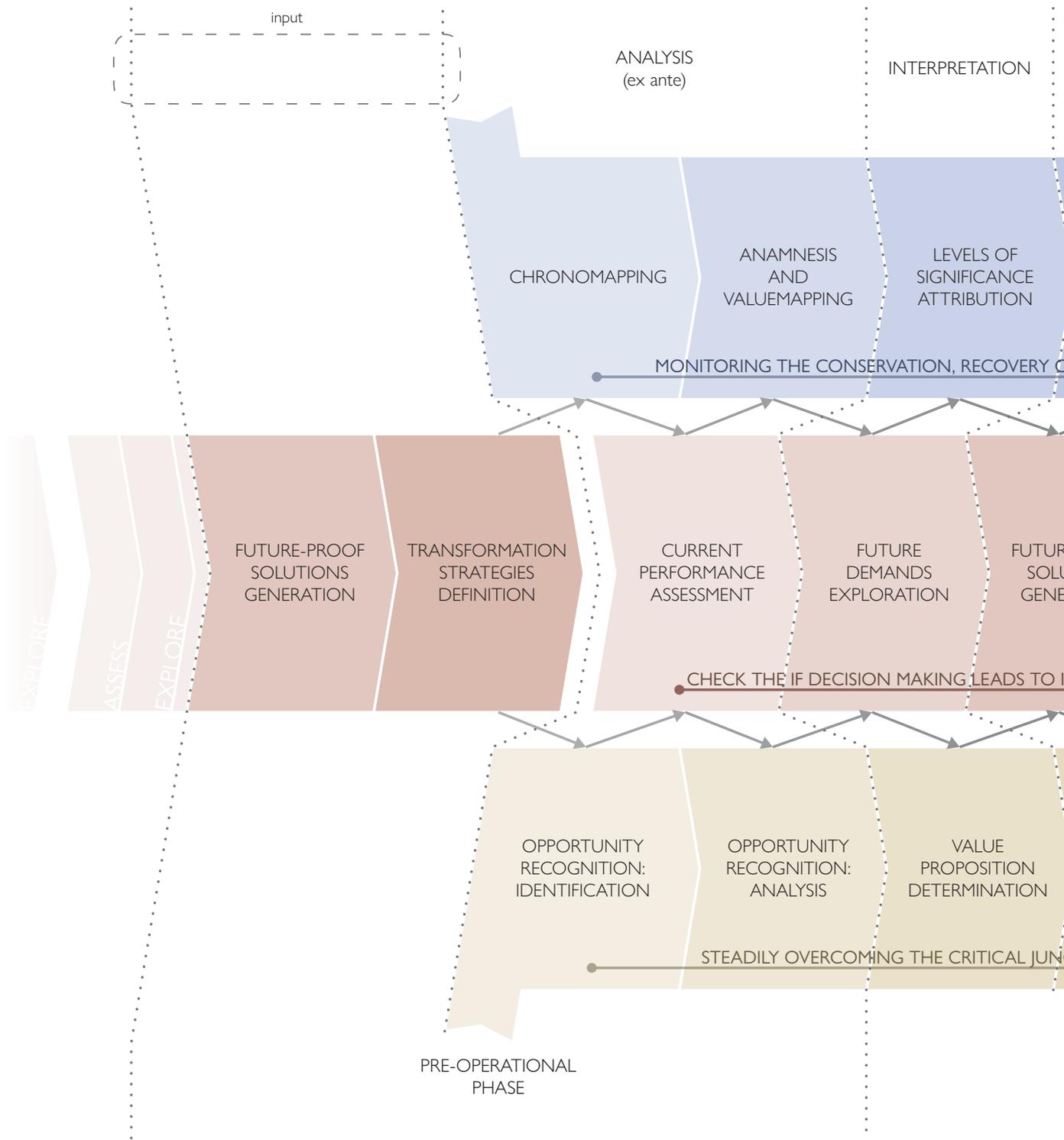
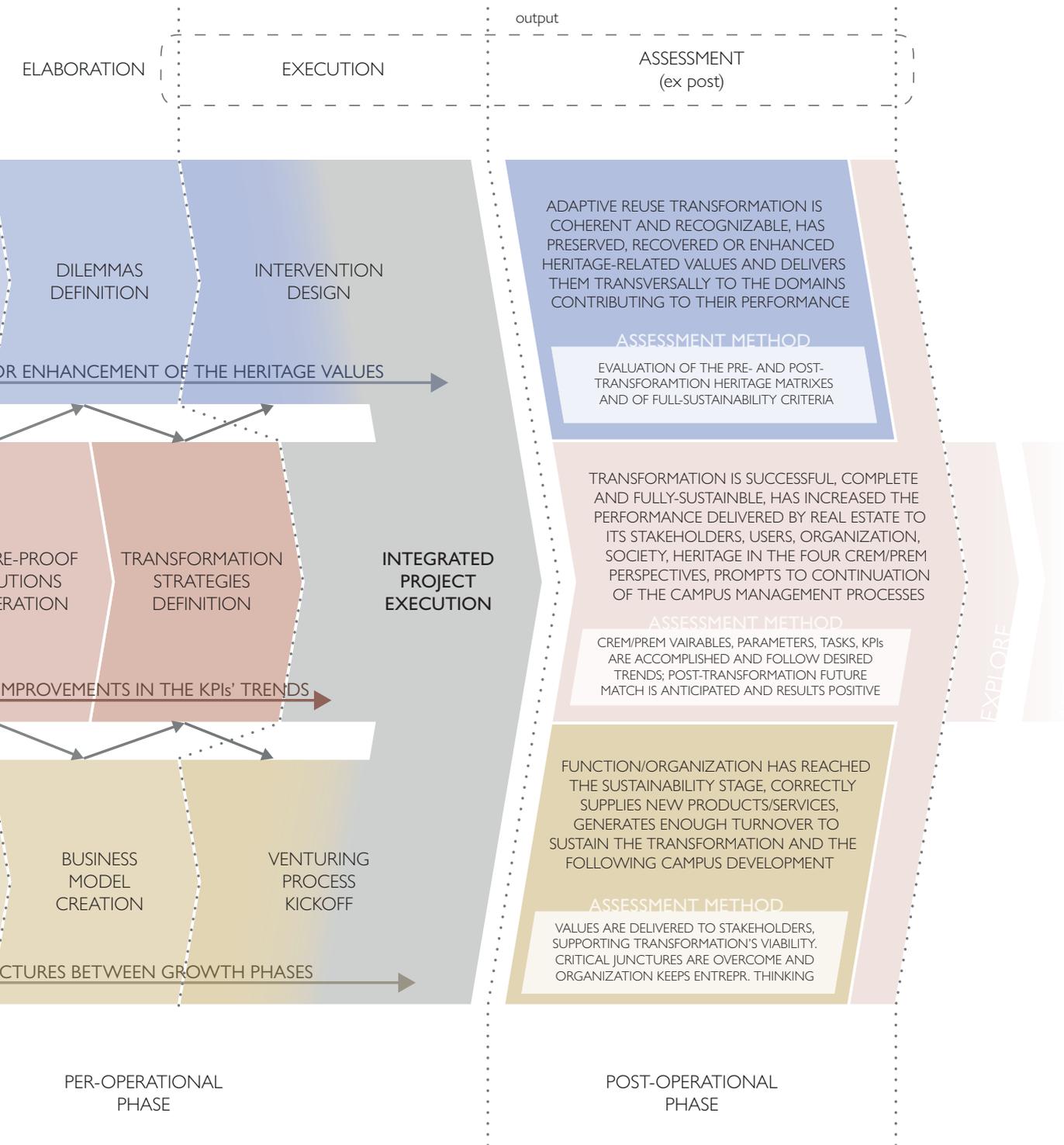


Fig. Full detail representation of the proposed integrated operational architecture



23:
Operational model for the adaptive reuse of dismissed historic
complexes.

6 COMPARATIVE ANALYSIS BETWEEN THE SERIAL AND THE INTEGRATED OPERATIONAL MODELS

This last dynamic closes the operations of the integrated operational model for the adaptive reuse of dismissed historic architectural complexes and returns the portfolio operations to the campus managers. The completion of the adaptive reuse operations additionally allows an overview of the entire integrated operational model from the reception of the managerial input to the integration of the adaptive reuse output in the campus development continuity (in analogy with den Heijer 2011, 92 fig. 3.2). This enables its visual – throughput – representation as the sum of its consecutive procedural and/or operational phases (fig. 23), and the possibility of a comparison with the current serially-organized adaptive reuse operational model.

6.1 Implementation and pre-operational processes

As for what regards the insertion point of the adaptive reuse operations in the REM continuum, the parallel and the serial operational models don't show any difference. Each of them in fact can be mutually-exclusively enacted in response to the determined necessity for broad-spectrum transformations, prerogative of the pre-operational campus management decision-making processes. Both are also introduced following the completion of the pre-intervention DAS cycle, and use its defined future models (third task) and transformation project (fourth task) as the CREM/PREM input of their operations. However, the serial operational model purely approaches this data reactively. This way, it substantially assumes the lack of a complete range of managerial information, interpreting the received general and predictive KPIs as final transformation goals. Consequentially, it extracts the necessary control processes from the campus management continuum before

interrupting it and uses them to complement the data input before directly forwarding it to the first of the extra managerial intervention domains. Quite oppositely, the parallel domain approaches the CREM/PREM input in a composite hybrid reactive/proactive way. On one hand, such approach allows it to use the generic and predictive characters of the data to define the boundaries and the mainlines of its operations. On the other, it enables the extra-managerial domains to use it as the reading key on which to generate their own intervention boundaries and complement/perfect the managerial input before being employed by the successive transformation processes. Its execution through a two-stage cross-informed procedure that requires the joint analysis of the three intervention domains gives this last dynamic a crucial three-fold performance for the parallel operational model. Firstly, it prompts to a further DAS-based campus management cycle. This enables the prosecution of the REM continuum throughout the operations and the continuation of its management control processes. Secondly, it simultaneously introduces the two extra-managerial intervention domains in the adaptive reuse operations and aligns them to the managerial one. This allows the synchronized execution of the operations of the three domains, as well as their cross-information, coordination and integration through the continuous process of information/support/assessment – and eventually update – performed by the managerial pipeline. Additionally, it introduces the control processes of the extra-managerial domains to be performed in addition to the managerial ones. Thirdly, it allows the following operations to receive an improved, narrower and cross-informed input that, still presenting a certain level of ambiguity, grants the adequate room for interpretation. As a result, the adoption of a parallel operational model rather than a serial one leads to no disruptions in the REM continuum and encourage the inclusion of the CREM/PREM perspectives (and tasks) in the operations. Additionally, it calls for the early participation of the extra-managerial domains and stakeholders and to their participation in the definition of the adaptive reuse transformation. This prompts to the full-sustainability of the operations, to enjoy from a greater stakeholder support network and eventually to a higher chance of succeeding in the transformation goals. However, it also requires commitment from the stakeholders (up to their involvement as partners) and more coordination among the intervention domains. Nonetheless, it demands a much higher operational control and support, often procurable only by the supervision and coordination of a super partes subject.

6.2 Per-operational processes

While the serial and parallel operational models are partially comparable in their initial, pre-operational phase, they lose any possible contact point successively the introduction of the extra-managerial domains in the adaptive reuse operations. At the reception of the transformation brief generated by the pre-intervention full DAS cycle, the serial model focuses on enabling the transformations by facilitating their operations. This is achieved by limiting the interdependencies between the intervention domains, by emancipating as much as possible its viability from the interactions among stakeholders and by hierarchizing the interventions following an enabler-enabled criterion. In these terms, the highest importance is often given to ensuring the financial viability of the operations. As this is normally dependent on the successful change of function/organization, the financial/entrepreneurial domain is prioritized on the architectural heritage one. Because of this,

the input generated by campus management is immediately framed entrepreneurially to shape a venture capable of sustaining (possibly completely) the organization during and after the transformation. First it is employed for the recognition of the right opportunity relatively to the CREM/PREM tasks and variables, and to the creation of a value proposition capable of receiving a sufficient support from the identified stakeholders. Successively, these elements are used to develop a business model capable of pursuing the KPIs trends previously defined, of activating the value chain and of eventually instating the new function/organization in the campus by kicking off the venture process. Only then, the venture and its stakeholders inform the architectural heritage domain with their functional, managerial and strategic programs. After having mapped the chronological events, the physical traits and the values of the campus, the architectural domain incorporates the entrepreneurial outcomes to determine the significance of the heritage in respect to the intended function and to its stakeholders' interests. Only then the information is used to define the design themes and the approach to the heritage values, translated into a coherent transformation project and proposed for the execution approval to the stakeholders. Vice versa, after having set up a ground for cooperation between the intervention domains and having cross-informed them on the mutual advantages in persecuting the entrepreneurial opportunity, the values enhancement and the REM performance increase (in each of their perspectives), the parallel model focuses on enabling the transformation by further integrating their operations. This is achieved by tightly connecting the processes in each domain's matching procedural phases, by supporting and fostering their activities and the information exchange among them and by developing their operations synchronously in a reciprocal promotion and enhancement progression. The resulting increase of the complexity in the conduction of the adaptive reuse operations is dealt through the subdivision of the entire intervention into smaller, more coherent (project-wise) and controllable (process-wise) procedural phases. The increase of the amounts of data, tasks and problems to be handled by each domain is traded with the overlaps among the objectives of the three pipelines, reciprocally contributing to breakthrough each other's impasses. Differently from the serial model, the parallel one does not prioritize the operations of a domain on the others, allowing the safeguard of the CREM/PREM perspectives and stakeholders throughout the entire operations. Instead, after having complemented and focused the proactive managerial input with the reactive extra-managerial analysis, the parallel model channels it through the three domains' pipelines simultaneously. A slight anticipation is given to the managerial processes to allow them to perform their tasks of information/support/assessment for the other domains, and to allow them to update its CREM/PREM parameters, variables, tasks and KPIs. Initially, the entrepreneurial analysis and the defined opportunity are matched with the heritage tangible and intangible traits of the campus and its values to inform the range of future demand exploration. Once completed the investigation, the three domains come together to decide the specific transformation direction. On this are then selected the relevant CREM/PREM parameters, variables, stakeholders, tasks and KPIs between the ones previously defined by the transformation vision of the original managerial input. This information is then used to determine the most suitable value proposition for the stakeholders' networks of the three pipelines and to improve the attribution of the appropriate significance levels to the different categories of heritage values in the different scales of the campus. These are then managerially framed into a future-proof model that, describes the final inherent and reciprocal configuration of the CREM/PREM perspectives, directs to the achievement of the

transformation aims. The model is fully incorporated in the business models of the three pipelines and in the definition of the appropriate design themes and approach to the heritage, which complete the set of information constituting the adaptive reuse transformation. The entire picture is ultimately processed by the management domain that precisely and programmatically defines the transformation strategy and its actuation methods and finalizes the CREM/PREM variables and parameters before the actuation of the integrated intervention. At the point of deciding on the execution of the interventions, each domain's managers, partners and stakeholders find themselves in different situations (both in relative and absolute terms) dependently from having adopted the parallelly or the serially organized operational models. They also end up dealing with diverse transformation projects and information. The serially organized operational models, for instance, base their operations on the CREM/PREM tasks, variables and parameters identified by pre-intervention full DAS cycle. Their general/predictive nature makes them less relevant for the other extra-managerial domains and hampers the efficacy or the managerial control dynamics throughout the operations, increasing the chances for the transformation to develop off-vision. Such eventuality is strengthened by the entrustment of the conduction of the operations to the single domains alternately. Combined to the fact that the success of the extra-managerial domains is a condition for the completion of the entire transformation (being both one-shot operations) this in fact allows them to override the managerial input with their own, depleting the initial CREM/PREM vision. These occurrences become blatant in correspondence with the last extra-managerial intervention domain (often the architectural heritage one), whose operations are held in direct function of the one preceding it and require their managers and their stakeholders to make substantial compromises. On the other hand, the parallelly structured operational model develops its operations on a full campus management DAS cycle taking place throughout the operations and synchronously with the extra-managerial procedural phases. This allows to use the initially defined CREM/PREM tasks, variables, parameters and KPIs to circumscribe and orient the transformation direction by framing the reactive heritage and entrepreneurial approach. In turn, this endures their extra-managerial recognition and consequentially their correction, update, developments, specification and perfection by the three intervention domains jointly, towards the definition of a final, fully-sustainable and integrated transformation strategy. Additionally, the synchronized parallel execution of the processes intervention domains reduces the possibilities for them to prevail on the others and overrule the managerial input. Nonetheless, it grants their smoother and more effective execution through the combined employment of their own inherent control dynamics. These observations lead to another major difference between the serial and the parallelly structured operational models. Compared to the latter, the first presents a much higher number of intra-operational discontinuities between the domains. This entails a wide range of negative consequences on the operation, ranging from a less efficient and loose information management to the interruption of the transformation processes. These effects also occur in both models in correspondence with the REM gap due to the enaction of the adaptive reuse operations. However, when these are conducted parallelly, the entity of the gap is reduce to the exclusive duration of the execution phase (instead of for the whole operations), with the additional consequence of a better match between the intended transformation and the effective integrated intervention results. In general, the parallelly-structured model induces the fully-sustainable conduction of adaptive reuse transformations (in the perspective of the three interventions domain) because of the

integration among their inherent processes. They also guarantee a greater chance of being approved for execution by gathering the support of the domain's stakeholders networks through their active involvement in the transformation definition.

6.3 Transformation execution, post-operational processes and information restitution

Among the different moments of the adaptive reuse operations, the ones corresponding to the execution of the interventions and to their reintroduction in the campus' REM continuum are the ones that less stand comparisons between the two models. In the serially organized operational model, the execution of the transformation is directly informed by the last of the intervention domains in the sequence, while its outcomes are directly fed into the REM continuum of the campus, which proceeds to assess them. The parallel model, instead, not only provides for the joint presence and cooperation of the three intervention domains both immediately before (as informants) and immediately after (as assessors) the execution phase, but also actively integrates the extra-managerial ones in the executive phase itself and, post-transformation, in the assessment for the REM continuum restoration. As for what concerns the information of the execution phase in the serial model, two are the main problems arising, both of them due to the lack of direct contact with two of the intervention domains. In the cases prioritizing the entrepreneurial one on the heritage one, the first is due to the lack of control that the earlier has on the operations of the latter, which is appointed to determine ex-post the most appropriate heritage intervention for the venture journey of the designated function/organization. The second is the absence of the two extra-managerial domains simultaneously within the execution phase. Both of them contribute to disable the possibility of phasing the transformation, which is instead an option (if not the standard choice) in parallelly-conducted situations. These two elements, in fact, prevent any possibility of synchronization between the growth stages of the entrepreneurial venture, the physical phases of the heritage transformation of an architectural complex and the programmatic character of the CREM/PREM parameters and tasks. These are the essential and minimum requirements for the execution phasing to be even only considered. Because of this impossibility, the projects generated by serially-structured operational models are more susceptible to executive complication and impasses. This makes them more subject to a higher risk of failure due to the drop out of the stakeholders, the depletion (or reallocation) of the necessary resources and/or the closure of the transformation window of opportunity. Analogously, the comparison of the transformation outcomes assessment reveals the absence of the extra-managerial domain if actuated following a serially-organized operational model. Its first, immediate consequence is the impossibility of adequately conveying the heritage and entrepreneurial actual transformation results (relatively to the intended ones) into the post-intervention REM continuum. In the situation of little correspondence between the initially planned transformation and the factually executed one, the incommunicability of this data represents an additional information loss. This convolutes even more the managerial assessment of the results, at the base of a coherent prosecution of the campus development processes. The second but equally important repercussion is the complete segregation between the operations and the post-operational REM continuum, whose resulting slackening and detrimental puts at stake the durability of the heritage intervention and of

the newly instated function/organization. In the perspective of avoiding the value losses by increasing the full sustainability and the success of the adaptive reuse transformations, the cross-domain integration provided by the proposed parallel model provides a better performance even in regard to the intervention(s) execution. Nonetheless, it also ensures greater and more sure achievements in the assessment of the transformation results and in the viability of the installed organization/function and in the durability of the heritage reactivation, valorization, preservation and enhancement.

Once completed, the comparative analysis between the current serially-organized adaptive reuse operational model and the proposed parallelly-structured integrated one reveals also a final, additional insight regarding the initial hypothesis. Specifically, it validates the assumption for which the lack of integration within the processes of the adaptive reuse operations consistently contributes to exacerbate the phenomena at the origin of the loss of values of defunctionalized enlisted historical campuses. This occurs directly by preventing the transformations or precluding their full sustainability, as well as indirectly by inhibiting the information/support/assessment of the extra-managerial processes, which excluding the CREM/PREM perspectives from the operations costs the transformations their stakeholders' support.

7 CONCLUSIONS

This research observed that the loss of architectural, urban, functional, economic, historic and socio-cultural values inherent to defunctionalized historic campuses is currently unavoidable whether these complexes undergo (or do not undergo) adaptive reuse transformations. The serially organized structure by which adaptive reuse operations are configured is identified as the main cause of these losses. By providing poor information management, presenting critical discontinuities and missing any cross-domain integration dynamics, this in fact prompts to the instatement of demolition, degeneration, degradation or abandon processes. To the purpose of avoiding such flaws/phenomena, the current serial operational model is reconfigured to integrate the domains involved in adaptive reuse transformations, eventually improving the information transfer and avoiding procedural discontinuities. The resulting alternative operational model proposed is based on campus management theories – which constitute the campus' REM continuum – and presents a parallel configuration rather than a serial one. Through this structure, its the three intervention domains progress synchronously and establish collaboration and mutual coordination relationships. Once defined in its details, the effectiveness of the proposed integrated operational model in achieving its purposes is assessed by means of comparison with the current serially organized one.

The comparative analysis between the proposed parallelly organized integrated operational model and the current serially organized one shows how, preferring the first to the latter, campus management can be employed to foster and support adaptive reuse transformations of defunctionalized historic campuses. The comparative analysis also substantiates how, in this way, such transformations acquire a fully sustainable character, which promotes their execution and increases the chances of their successful completion despite

their large-scale, broad-spectrum of intervention, cross-domain nature and of the one-shot character of the interventions they involve. Eventually, this prevents the instatement of degeneration, demolition, degradation and abandon processes, resulting in a consistent reduction of the architectural, urban, functional, economic, historic and socio-cultural value losses observed in this intervention scenario, up to even enabling their otherwise unachievable restoration, preservation or enhancement (research question A).

The parallelly organized operational model allows to deliver this performance over the current serially organized one by matching the processes of the linear (extra-managerial) and cyclical (managerial) domains participating in the transformations, reframing them in coherent and integrated procedural and operational phases throughout the entire operations (research sub-question B1). By integrating the campus management processes with the correspondent extra-managerial ones in each procedural phase, campus management ability of informing, supporting and assessing the operations is furthermore rehabilitated. The coordination between the three intervention pipelines confers a full sustainability character to the transformations, dramatically increasing its chances to reach its conclusion and to return positive outcomes in architectural heritage, financial/entrepreneurial and CREM/PREM managerial terms (research sub-question B2). Additionally, the integration of campus management throughout the transformations allows their optimal integration as an extra-ordinary portfolio management operation within the campus development processes, eventually facilitating its insertion in the REM continuum without excessively disrupting it (research sub-question B3). The resulting continuous pre-/per-/post-operational consideration of the CREM/PREM perspectives and solid control over the processes of the extra-managerial domains enables a greater consideration of the interests of both present and perspective stakeholders from the three domains jointly. In turn, this provides a higher and consistent support to the transformation from its start to its very conclusion, further directly and indirectly contributing to achieve the transformations' fully sustainability, its viability and eventually its success.

The comparative analysis and the consideration of the integrated operational model as an actual toolset employable for the conduction of adaptive reuse operations prompt to further improvements, by no means less relevant than the ones strictly related to the research question(s). Most of them are enabled by the possibility that the integrated operational model provides of phasing the execution of the defined adaptive reuse transformation rather than bringing it to conclusion in a unique one-off, one-shot operation (as by the serially organized operational model). This allows the integrated operational model to address the wickedness brought to this specific transformation scenario by its heritage and dismissal statuses, while minimizing the corollary typical of inherently one-shot operations at the same time (Rittel and Webber 1973; Bachrach and Baratz 1963; Kingdon 1984). Analogously to the dynamics observed for the loss of values of these complexes, the upgrades due to the possibility of phasing the execution of the adaptive reuse transformation generated by the proposed integrated operational model are generated in a trickle-down sequence, collateral (and at the same time supplemental) to the one configured through the proposed thesis.

The most important element that phasing enables is the much lower risk connected to the realization of the defined transformation. For risk is intended the chance of losing

control on the transformation processes and outcomes, which can entail a wide range of consequences ranging in magnitude from a simple slackening of the operations to their complete interruption, potentially reinstating the original value-losses. In a first place, phasing represents a great risk management tool as it gives the opportunity of splitting the complete adaptive reuse transformation into smaller, faster, more coherent and controllable incremental portfolio management operations. While realized within the vision/mission defined through the combined proactive/reactive approach of the operational model in receiving the managerial input, they allow a more agile adaptive reuse campus development by tolerating ambiguity and providing room for adjusting the transformation direction (den Heijer 2011; Aulet 2013; Green 2015). These characteristics, in turn, allow to better identify the transformation environment, making the operations less prone to be affected by external hindrances (such as changes of the boundary conditions, macro-economic mutations, sudden lack of resources etc.) as well as internal ones (such as operational breaks, procedural impasses or critical junctures) and supply it with a pronounced future-proof character. Additional dynamics within the integrated operational model contributing to the risk management of the transformation are represented by the steady development of the cross-domain CREM/PREM variables and tasks throughout the operations on one hand and by the coexistence of each domain's control processes on the other, which result in a better development of the CREM/PREM variables' trends. A further degree of risk management is provided by the proactive character of the managerial input, which enables more safe, sure and sustainable extra-managerial interventions and leads to more durable and viable transformations, sensibly anticipating the future match of the post-transformation DAS cycles.

Consequently to the drop of the risks due to the enactment of the integrated operational model, the operations enjoy of a much wider consensus and support from the networks of stakeholders involved in the adaptive reuse transformations. While these are also granted by the greater consideration of the stakeholders' interests in the definition of the transformation, they are also further strengthened through allowing the stakeholders to participate in the decision making processes since the early phases of the operations. The involvement of the stakeholders then comes from the establishment of cross-information and collaboration dynamics and prompts for them to build up their commitment, to search for their mutual support and to define and achieve common goals. Its consequences are on one hand a more solid and rooted connection of the campus (and of its newly installed function/organization) within the context regional and global contexts (and the related stakeholder networks) as by the identified future model of development and on the other a dramatic decrease of their drop-out rate. The latter, specifically, is strengthened by the operational continuity introduced by the parallel alignment of the intervention domains, whose operations – subject to fewer interruptions and more resolvable impasses – better retain the stakeholders' interests at stake for enhancement or depletion.

The merger of the interest among the stakeholders networks of the three intervention domains induces in the integrated operational model also other attributes which are never to be found in its serially organized counterpart. For instance, it allows the campus to back the physical and temporal compresence of the stakeholders in the operations by enabling their face-to-face contacts and by harmonizing their confrontation topics, coordination methods and cooperation dynamics throughout the entirety of the procedural phases.

This possibility allows an easier, more controllable and faster information transfer, a reduction of the costs inherent to the adaptive reuse transformation (and to the campus management by extension) and an enhancement of the values that the stakeholders can receive through their participation in the operations (also by the constitution of economies of scale and scope - Nadler, in Squires, Heurkens, and Peiser 2018, 153–68). Also, it supplies the operations with an high degree of self-efficacy, introducing by the possibility for each intervention domain and process to contribute in reciprocally procuring breakthroughs to each other's impasses (Teisman 2002; Vohora, Wright, and Lockett 2004). Primarily, this results in making superfluous the subordination of the extra-managerial domains one to another, fostering and promoting instead the reciprocal enhancement of their individual and shared value propositions. This becomes particularly clear, for instance, in the promotion of the heritage values through the reestablishment of a coherent function, or vice versa through the improvement of the functional and managerial tasks thanks to the available heritage traits. Secondly, this allow to enjoy fully of the joint contribution of the CREM/PREM perspectives and of the architectural heritage one to the entrepreneurial opportunity identification. Tightly relating the pains, the gains and the tasks within the VPCs of the three domains, this allows to define cross-domain pain relievers, gain creators and required performances, and eventually prompts to successively generate the three BMCs in the same terms. Tertiarily, as these phenomena increases the stakeholders' willingness to pay (Binnekamp et al. 2016), they attract additional investments and venture capital and enable the possibility of carrying on the transformation in a regime of self-sustainability, (partially) emancipating the operations from external financing. In a fourth, final place, these dynamics contribute to support the consideration of the soft qualities required and valued by the stakeholders over the hard qualities strictly characterizing the physical component of the real estate, inducing the implementation of more balanced cost/quality control processes (Gerritse 2008).

8 RECOMMENDATIONS

The potential performance increase attainable by employing the integrated operational model in the definition of adaptive reuse operations, however, also requires to confront with other aspects, most of which are directly or indirectly related to the question: “If this alternative model is this better than the current one, why has it not been enacted yet?”. These aspects are numerous and differently arguable; the most relevant to the evaluation of the integrated adaptive reuse operational model are here discussed in three answers.

A first answer is to be found in the higher magnitude of operational complexity that this model presents over the serially organized one. The integrated operational model is not intuitive, it does not allow each domain to exercise at full its intervention autonomy, requires a greater effort for its control, coordination, supervision and execution and prompts since its very beginning to longer time estimations. To the eyes of a prospective conductor, of each individual intervention domain manager and of the stakeholders critical to the adaptive reuse transformation’s processes, these characteristics are generally not appealing nor represent an incentive to actively set up these operations and participate in them. This is why, consequently to the manifestation of relevant value losses, these campuses enjoy of the grater attention of one or more pressure groups (or entities) pushing for the relevant actors to intervene on them. However, these pressure groups are usually oriented towards more domain-specific transformations and reach to the relative domain managers with little-to-none value proposition to gain their participation. Even if, the increased amount of connections, information, dynamics and stakeholders per pipeline would not allow the domain’s managers to directly conduce or promote processes other than of their own domains. Additionally, it is not rare for the managers of dismissed enlisted campuses to lack the necessary resources and skills to promote the adaptive reuse

transformation of their portfolios. For these reasons and up to certain extents, it is recommended to identify in the conductor of the adaptive reuse operations also the promotor of the transformations, trying to gain each domain's manager participation by involving them in the early stages of the transformation definition. To foster and actuate similar eventualities, though, an essential requirement stands in the neutrality of the promoting/conducting subject, whose eventual bias towards one domain rather than the other would risk the collapse the network of stakeholder relationships within the integrated operational model.

A second answer, instead, lays on the reliance that the integrated operational model has on its stakeholders and their networks to achieve its full sustainability criterion and to lead the transformation to its successful completion. While the integrated operational model proposes them to participate in a transformation with lower risks and higher gains, to involve them in the early design phases and to safeguard their respective interests through the instatement of mutually advantageous dynamics, there is a chance that the proposition is not sufficient for them to decide in favor of their involvement. This could, for instance, happen in the early stages of the transformations, where the high complexity of the processes, the distance from the prospective gains and the slowness of the transformation progression may deplete the interests of the stakeholders in the transformations. Oppositely, it could also happen that too many stakeholders decide to participate in the initial phases of the transformations, resulting in the operational model overload and eventually in the arrest of the operations. In both scenarios, the reduction in terms of transformation's full sustainability can substantially decrease the efficacy of the integrated operational model to avoid the observed loss of values. Such scenarios are approachable by considering that among the stakeholders' networks there are certain ones whose participation is a critical, sine qua non causation for the success of the operations. These stakeholders are often key members of the network at the scales (regional/global) identified through the model generation and/or the public authorities of the city in which the campus is located. It is therefore recommended to target the value proposition particularly to them and to involve them as early as possible in the operations. This way the transformation can more steadily attract further participants and networks and involve them in its relevant phases once that the decision making table is set-up for them to participate in the transformation processes. Eventually, the definition of a clear transformation vision, of a strategic mission and of a campus identity can improve the image perception of the participating stakeholders (other than their performance) and attract in the further transformation phases those stakeholders whose involvement was not possible until the reduction of the risk within a lower threshold than the initial one.

To involve the key stakeholders at the right scales, an adaptive reuse transformation carried out through the integrated operational model, however, has to present them a consistent value proposition (to their perspective) and has to demonstrated its viability by successfully implementing their partnerships in its business model. In this perspective, it is recommended for the adaptive reuse operations on dismissed historical campuses to focus on the key stakeholders at two specific scales: the one of the city and the one of the region, in this very order. The involvement of the key stakeholders at the city level (sometimes resulting from bottom-up approaches) can be often obtained by establishing round tables with the local public authorities, the prospective immediate users, the society and the

ownership of the real estate. This allows for the first transformation phase to be emblematic, in the wider regional scenario, due to be predominantly locally sourced. Backed by local stakeholders, presenting peculiar traits contributing to the value proposition and already started in a fully-sustainable (and possibly profitable) way, this transformation (and the campus) can be then inserted in the wider regional scale. For this to happen it is essential for the “see” components of the entrepreneurial opportunity analysis to be hard-coded in the organization since after the first execution phase, as the involvement of bigger stakeholders is particularly susceptible to the opening of a window of opportunity. The involvement of the key stakeholders at the region level, differently from the city one, is normally framed within a top-down approach, which inserts the campus and its transformation in a network of a relevant scale for it to develop without competing for resources and stakeholders with other possible transformation in the same territorial scale.

A third answer, linked to previous ones, is represented by the issue of identifying an appropriate conductor subject for the adaptive reuse operations. While certainly its nature and characters should vary dependently on the specificity of the campus and of the transformation scenario, the trait shared by all these subjects should be to be capable of successfully using the integrated operational model (and its toolset) to conduct and supervise the operations and to control and coordinate the processes and dynamics involving the individual domain managers. This should in fact happen regardless the specificity of each transformation case. Because of needs to direct and oversee the entire operations and to control the processes pertaining to the single intervention domains in concert, the conductor is ideally represented by the subject owning the real estate. However, due to the original function of these dismissed historic campuses, this often coincides with the local governmental entity (ex. Municipality) or with a local public authority, whose nature best allows to deal with the architectural heritage matters but does not allow for participating in an actual entrepreneurial venture or for establishing one. In order to enable the possibility for the heritage to be maintained public, but also to be entrepreneurially employed in the adaptive reuse transformation, it is recommended to transfer the ownership to mixed public-private entities, and to identify in them the conductors of the adaptive reuse operations. While the configuration of these entities greatly depends on the legislation framework to which the campus is subjected (e.g. public-private consortiums, statutory corporations, public authorities, semi-public bodies etc.), they all share the possibility of internalizing public-private-partnerships (also known as PPPs) without depleting the public nor the private character of their operations. Because of this, they present several characteristics that are best employable in the adaptive reuse transformation of dismissed enlisted architectural campuses. In a first place, their public nature mitigates the risks due to private participations while still allowing the entrepreneurial push and the strategic flexibility of installing a new function/organization in the campus while directly safeguarding its heritage values. Secondly, it allows a wider access to grants, funds, loans, incentives, subsidies, capitals, tenders and other strategic and financial instruments essential for the involvement of further stakeholders and for the progression of the operations. Thirdly, it allows to internally employ revolving financial engineering instruments, consolidating the constituent partnerships and facilitating the inclusion of other private stakeholders/investors (Nadler, in Squires, Heurkens, and Peiser 2018, 153–68). Fourthly, it enables the access to international governmental and non-governmental platforms with adequate resources availability and potential interests in the specific transformation scenarios as well

as in their regional/national networks (e.g. the European Union, foundations, institutions etc.). Fifthly, it allows for the internalization of the externalities of the transformations, with a potential increase of the total value of the venture and of the performance of the real estate and a relieving effect regarding the common pitfalls leading to market failures. This includes the promotion of the triple bottom line-based operations, more aware and sustainable in financial, social and environmental terms. Sixthly, it promotes the strategic, functional, physical and financial positioning of the campus and of its organization in triple helix innovation networks (industry-university-government) and eventually also in quadruple and quintuple helix environments, as of now among the best ones in terms of prospective developments, mutual value enhancements and solidity of interaction.

9 REFLECTIONS

“If I only had more time...”. After the research question and sub-questions, this is the other most recurrent interrogation I posed myself while writing this thesis. Even considered the excessive time it took to be elaborated and written. Even considered that it embarrassingly exceeds its initial intentions. Even considered the impossibility of considering and including all and everything, a concept, for some, of not so easy comprehension. Even if, at the end of the day, this should have been concluded long ago.

This thesis has required a personally unprecedented amount of multi-disciplinary integration. This translated into broad and detailed research into the topics of decision making, heritage, architecture, history, corporate and public real estate, entrepreneurship and design. The more the knowledge and the notions I developed on these disciplines started to compose the picture of my thesis, the more I realized there would have been more to know, more to understand, more to consider, but I had eventually to stop. Because of this, the integrated operational model for the adaptive reuse transformation of dismissed enlisted campuses, while complete, misses several relevant aspects and considerations that are worth mentioning as a final word on this research.

The proposed integrated operational model, while complete and hypothetically viable, is completely based on theoretical elaborations and findings, which, while being grounded on empirical data, are not yet validated in a real case scenario. As the integrated operational model is by nature a tool to approach the specific adaptive reuse intervention scenario of dismissed enlisted campuses, its first employment in the definition of the transformation project of a case study would constitute a significant proving ground for its viability and effectiveness. It would additionally lead to the many insights on its capabilities

of describing the processes and the dynamics taking place throughout the operations, prompting to its own improvement, modification, update.

The model is additionally defined for the specific transformation scenario and only includes the strictly necessary domains to its operation. In this perspective, the integrated operational model still offers wide grounds for further investigation in terms on employability of different domains, different cross-domain integration methods, process-specific dynamics etc. For instance, the integrated operational model as defined by the research does not fully support the recursive dynamics participating to some processes of the extra-managerial domains (especially in the interpretation and elaboration procedural phases), which are only accommodated among the dynamics within the transformation execution. Additionally, the operational model does not specify on how the function/organization and the management program contribute in enhancing and restoring the heritage values of the campus, dangerously leaving the interpretation to the model conductor.

Even considered the great importance of the environmental sustainability aspects in real estate, architectural and entrepreneurial intervention, the proposed integrated operational model does not explicitly consider it among the intervention domains. On one hand this is because of the consideration that, by certain and different degrees, the environmental sustainability aspects are implicitly considered within the inner processes of the three intervention domains and are included among the themes of adaptive reuse transformations. On the other hand, though, it is as much true that its missing explicitness among the transformation domains and intervention dynamics risks to exclusively lead to the hypothetical consideration of the environmental consequences of such broad-spectrum adaptive reuse transformations. Because of this, future research could investigate on the implementation of the environmental sustainability domain along the other integrated operational pipelines.

The research also gives too little relevance to the elaboration on the interconnected elements of public-private relationship and partnerships (only implicit in the three domains), to the reinsertion of the transformed campuses in the regional and global settings of an intellectual agora network (mainly concerning the managerial domain) and to the potential represented by the conduction of these transformations as if they were flagship conversion projects (mainly concerning the extra-managerial domains - Alaily-Mattar et al., in Squires, Heurkens, and Peiser 2018, 43–55). The three elements together allow the transformations and the transformed campuses and campus-based organizations to enjoy the best of the advantages not only related to themselves, but also to their joint existence in values enhancement frameworks and methods such as the triple/quadruple/quintuple helixes, the triple bottom line etc. In general, by representing significant contributions to the full sustainability and to the overall success of the transformations because of mutual values enhancement, these aspects should be investigated more thoroughly in the future.

The research also too little investigates on the consequence that a so integrated adaptive reuse operational model, which involves so many local and regional stakeholders, has on the urban, regional and national development spheres. In general, there is little consideration of the possible externalities affecting the involved stakeholders, the society and the transformation itself. In the same perspective, the research does not consider the limits

and the boundaries imposed by legislation, and the ways to possibly approach them to achieve possible future breakthroughs in the discipline.

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12 APPENDICES

The integrated operational model for adaptive reuse transformations of defunctionalized enlisted campuses defined and proposed by the research intends to represent an improvement to the structure through which the processes inherent to these specific interventions are normally carried out. If its original aim is to be employed to contrast the value losses consistently suffered by this architectural typology, its trickle-down problem solving approach and the amount and scale of the processes, dynamics, theories and stakeholders expand its potential usability to a much wider range of situations. These can differ for a number of reasons, namely because of the problem at their origin, of the transformation phase(s) stage at which they occur, of the domains involved in the operations etc..

In light of these facts, the proposed integrational model intends to provide a two-fold performance. One, not strictly dependent on the contents of the addressed situations, is relative to the cross-domain structure of the operations and to the definition of the coordination schemes between its inherent processes. This proposition aims to be relevant to the project and process managers involved in complex, broad-spectrum and cross-domain transformation scenarios independently on the specificity of their own intervention. Its value stands in the facilitating role it has in respect to the coordination of the processes and to the information management and transfer. The other, inherently specific to the adaptive reuse transformation scenarios considered in the research, regards the adaptation of each of the three domain's processes in function of the ones taking place simultaneously in the other domains. Its goal is to define the terms by which they can cooperate, communicate and progress to achieve more fully-sustainable and successful outcomes in a "past-to-present-to-future" campus development perspective. This proposition is also aimed to the individual process, domain and project managers involved in the operations, in the

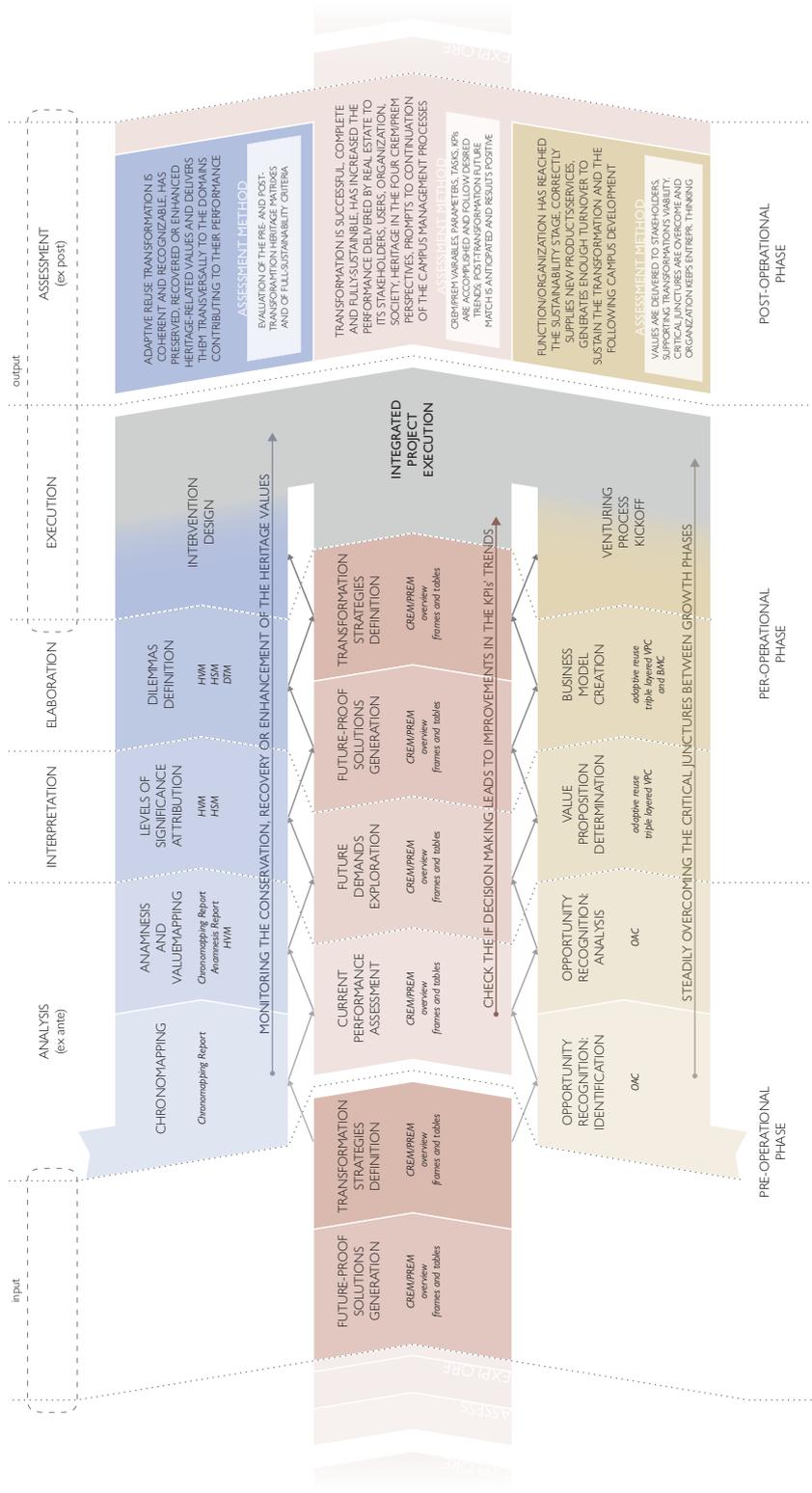
same terms of the other proposition and in the additional ones relative to the specificity of the considered transformation contents.

For the integrated operational model to deliver to its “customers” both the value propositions above, this research provides the toolset mentioned throughout its development additionally to the procedural explanation elaborated in chapter 5. This is attached to the research in the appendixes from A, B, C, and D. The toolset contains all the tools suggested by the research (organized per domain and in procedural order – eventually including templates and guidelines to employ them), as well as their mapping in the schematic overview of the integrated operational model. While all these documents are relevant (and essential) for the managers involved in adaptive reuse scenarios of defunctionalized historic campuses, the tool-map (and possibly the CREM/PREM domain’s tools) aims to represent a self-explanatory tool also for non-specific complex transformation scenario. In respect to both the research specific and the wider range of situations to which the integrated operational model can potentially be employed, the tool-map strives to represent more than a guide to the operations. Instead, it is proposed as a solid base for updates, reviews, corrections, improvements, notes and adaptations to the integrated operational model, in the belief and certainty that, because of its aims, this research couldn’t fully investigate nor prove its consequences at full extents.

APPENDIX A: INTEGRATED OPERATIONAL MODEL TOOL-MAP

This appendix contains the Integrated Operational Model tool-map (document A1). In this diagram the proposed integrated operational model is explained in full detail, and the tools relevant to each domain's processes are listed in correspondence of their utilization throughout the operations. For all intents and purposes, this diagram constitutes a blueprint for the employment of the Integrated Operational Model in broad spectrum adaptive reuse transformations.

A.R. INTEGRATED OPERATIONAL MODEL - TOOLMAP



Document A1:
Integrated Operational Model tool-map

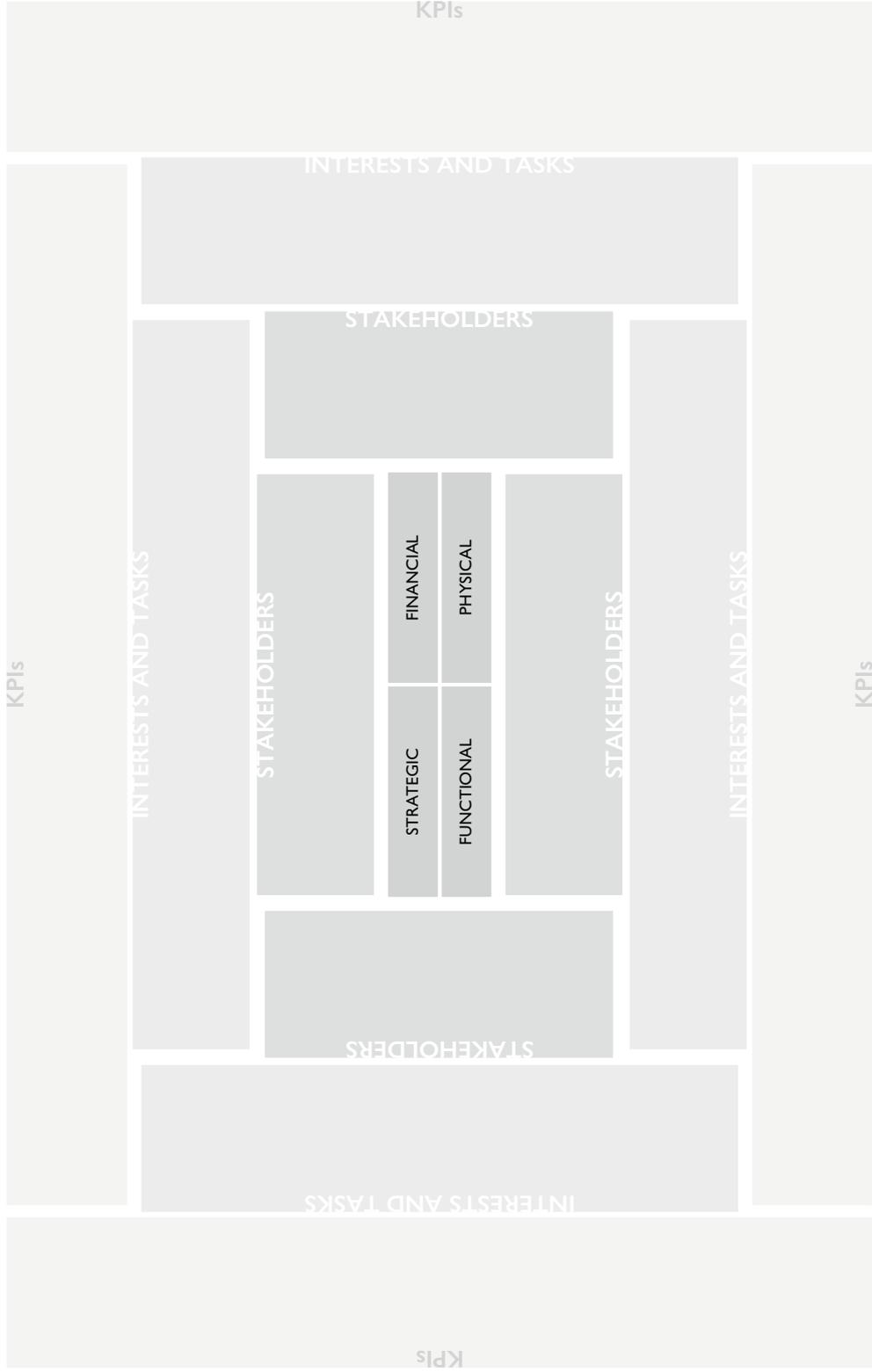
APPENDIX B: CREM/PREM DOMAIN TOOLS

This appendix contains the reference tools for the CREM/PREM domain to be employed throughout adaptive reuse operations in order to enable the coordination among the three parallel pipelines, the cross-information/support/assessment managerial task and the mutual participation of the extra-managerial domains to each other's processes. These tools are:

- B1: The CREM/PREM stakeholders involvement map;
- B2: The CREM/PREM stakeholders – tasks – KPIs frames;
- B3: The Intervention aims & KPIs per CREM/PREM perspective table.

These documents are intended to be steadily reviewed and then corrected, updated and perfected synchronously with the progress of the transformations, with the intention of reaching a clear and complete definition of the final transformation strategy accordingly to the managerial and extra-managerial operations' outcomes. They can possibly be implemented dependently on the specificity of the intervention and on the necessities of the project/process managers or of the subject in charge of coordinating the operations.

CREM/PREM STAKEHOLDERS - TASKS - KPIs FRAMES



Document B2:
The CREM/PREM stakeholders – tasks – KPIs frames;

INTERVENTION AIMS & KPIS PER CREM/PREM PERSPECTIVE

STRATEGIC	FUNCTIONAL	FINANCIAL	PHYSICAL

Document B3:
The intervention aims & KPis per CREM/PREM perspective table

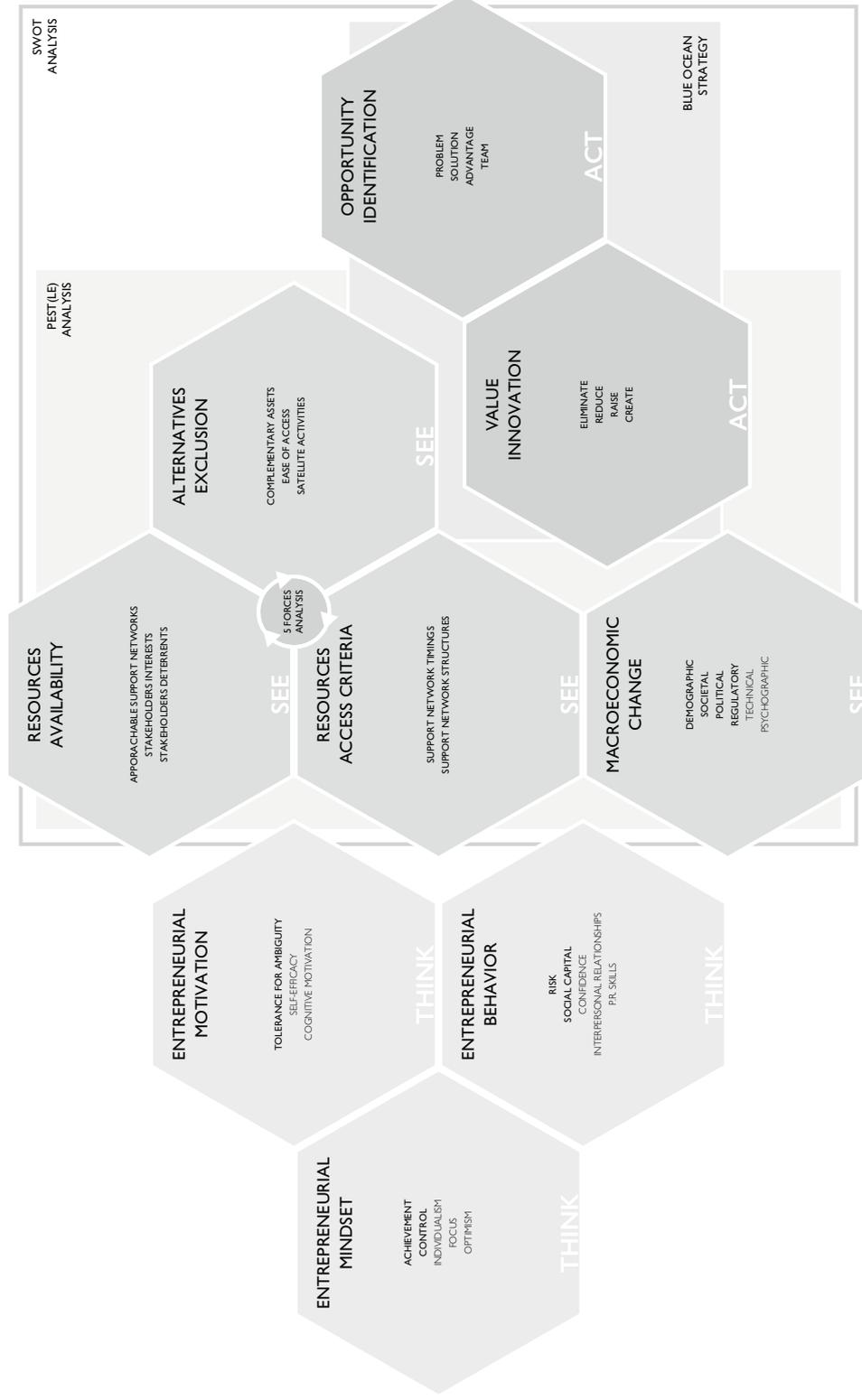
APPENDIX C: FINANCIAL/ENTREPRENEURIAL DOMAIN TOOLS.

This appendix contains the reference tools for the financial/entrepreneurial domain to be employed throughout adaptive reuse operations in order to enable the determination of the new function/organization, the creation of the relative venture creation and its full development through the successive entrepreneurial stages. These tools are:

- C1a: Guide to the compilation of the adaptive reuse Opportunity Analysis Canvas;
- C1b: The adaptive reuse Opportunity Analysis Canvas (OAC);
- C2a: Guide to the compilation of the adaptive reuse Value Proposition Canvases;
- C2b: The adaptive reuse architectural Value Proposition Canvas (aVPC);
- C2c: The adaptive reuse managerial Value Proposition Canvas (mVPC);
- C2d: The adaptive reuse entrepreneurial Value Proposition Canvas (eVPC);
- C3a: Guide to the compilation of the adaptive reuse Business Model Canvases;
- C3b: The adaptive reuse architectural Business Model Canvas (aBMC);
- C3c: The adaptive reuse managerial Business Model Canvas (mBMC);
- C3d: The adaptive reuse entrepreneurial Business Model Canvas (eBMC).

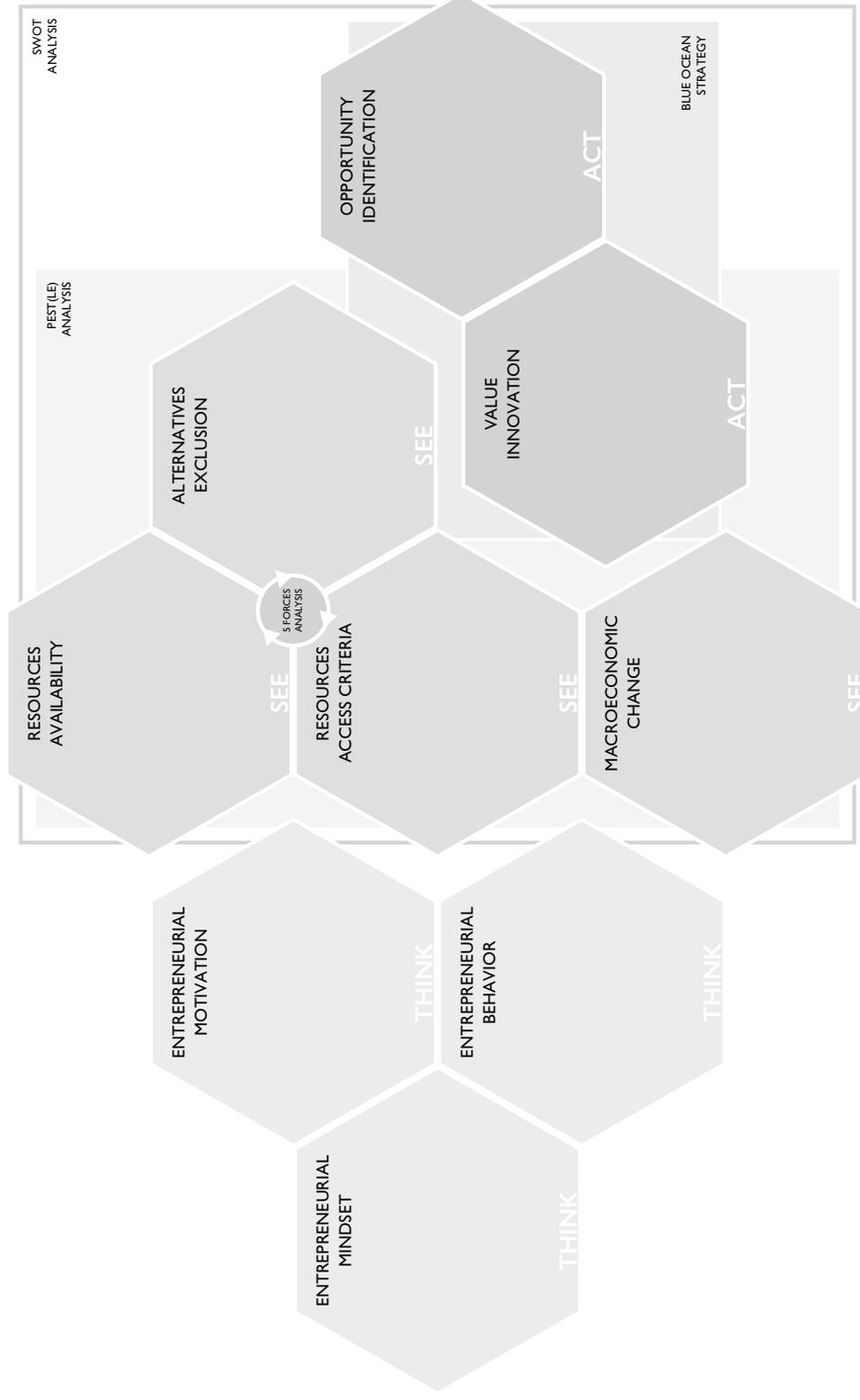
These documents are (partially) adapted from their original version (see relevant sections in chapters 3 and 4). They are employable in the different stages of the creation of the defined entrepreneurial venture and as support tools to overcome impasses or stalls due to the reach of an inter-development stages critical juncture. Documents C2 and C3 are inflected in three domain-specific complementary versions and should be eventually (at least) completed jointly by the three domains' managers. All of the documents can possibly be implemented dependently on the specificity of the intervention and on the necessities of the project/process managers or of the subject in charge of coordinating the operations.

A.R. OPPORTUNITY ANALYSIS CANVAS



Document C1a:
Guide to the compilation of the adaptive reuse Opportunity Analysis Canvas

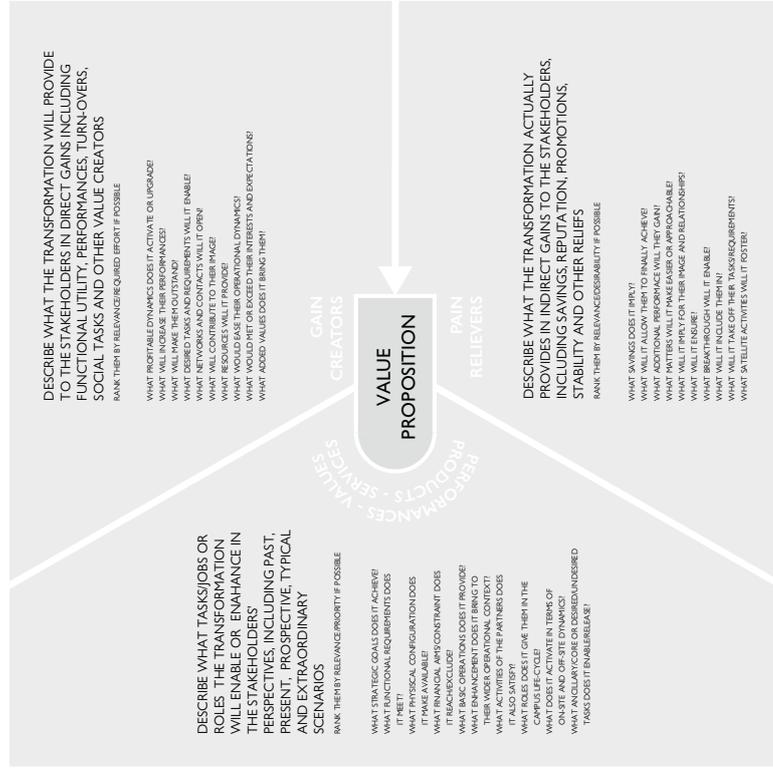
A.R. OPPORTUNITY ANALYSIS CANVAS



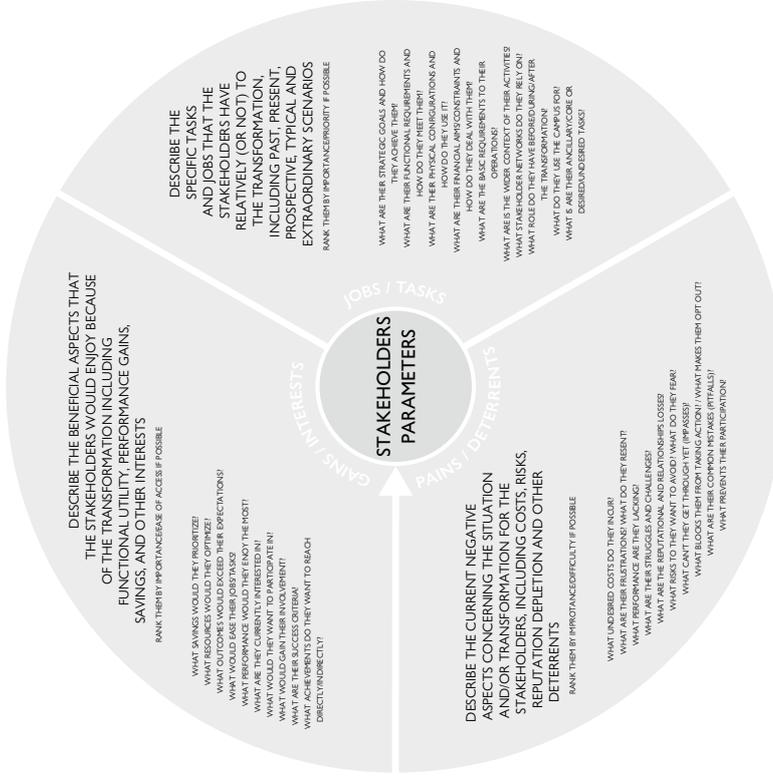
Document C1b:
The adaptive reuse Opportunity Analysis Canvas (OAC)

A.R. VALUE PROPOSITION CANVAS

VALUE PROPOSITION



SUPPORT NETWORK(S) AND PARTICIPATING STAKEHOLDERS

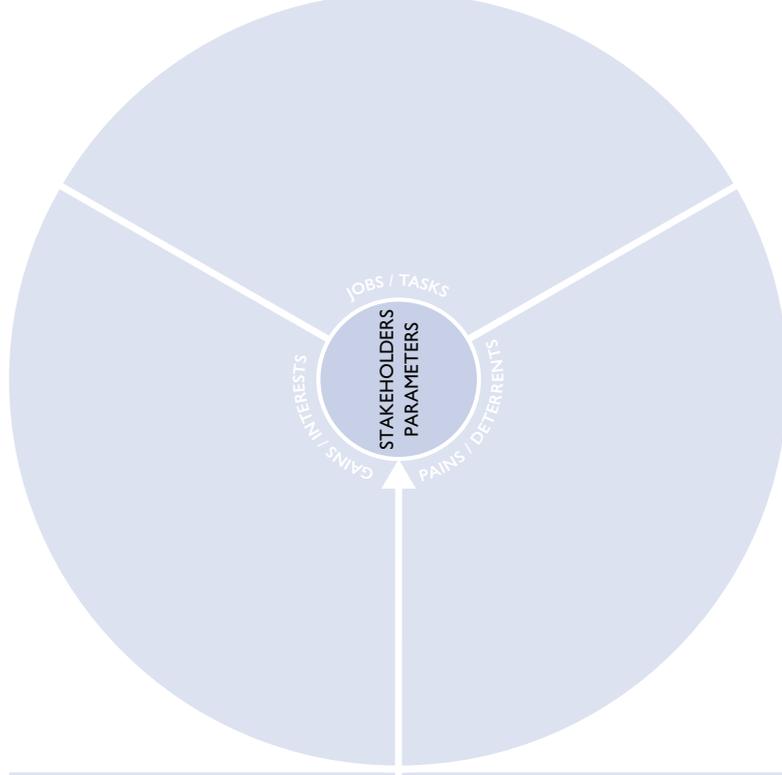
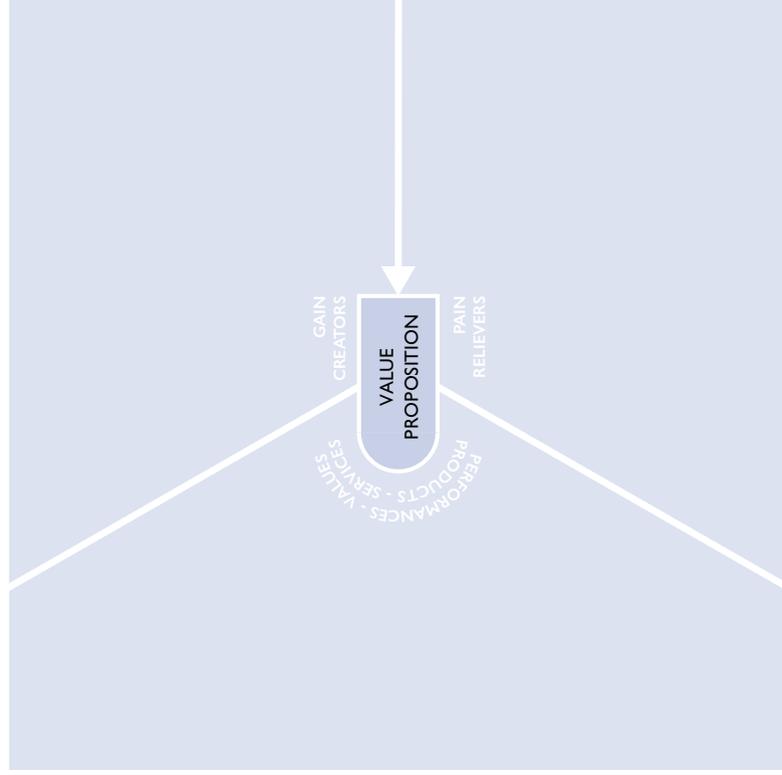


Document C2a: Guide to the compilation of the adaptive reuse Value Proposition Canvases

A.R. HERITAGE VALUE PROPOSITION CANVAS

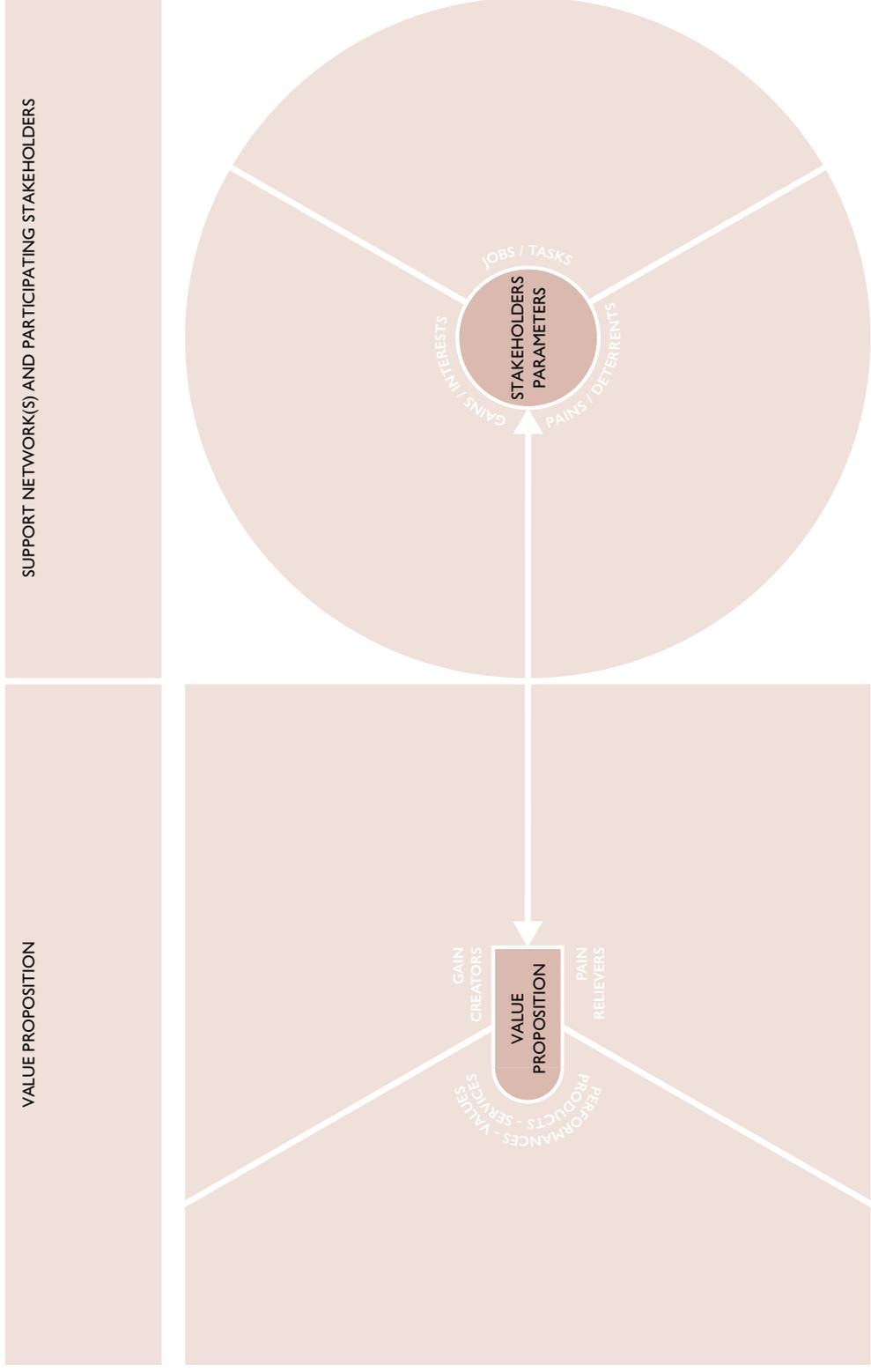
VALUE PROPOSITION

SUPPORT NETWORK(S) AND PARTICIPATING STAKEHOLDERS



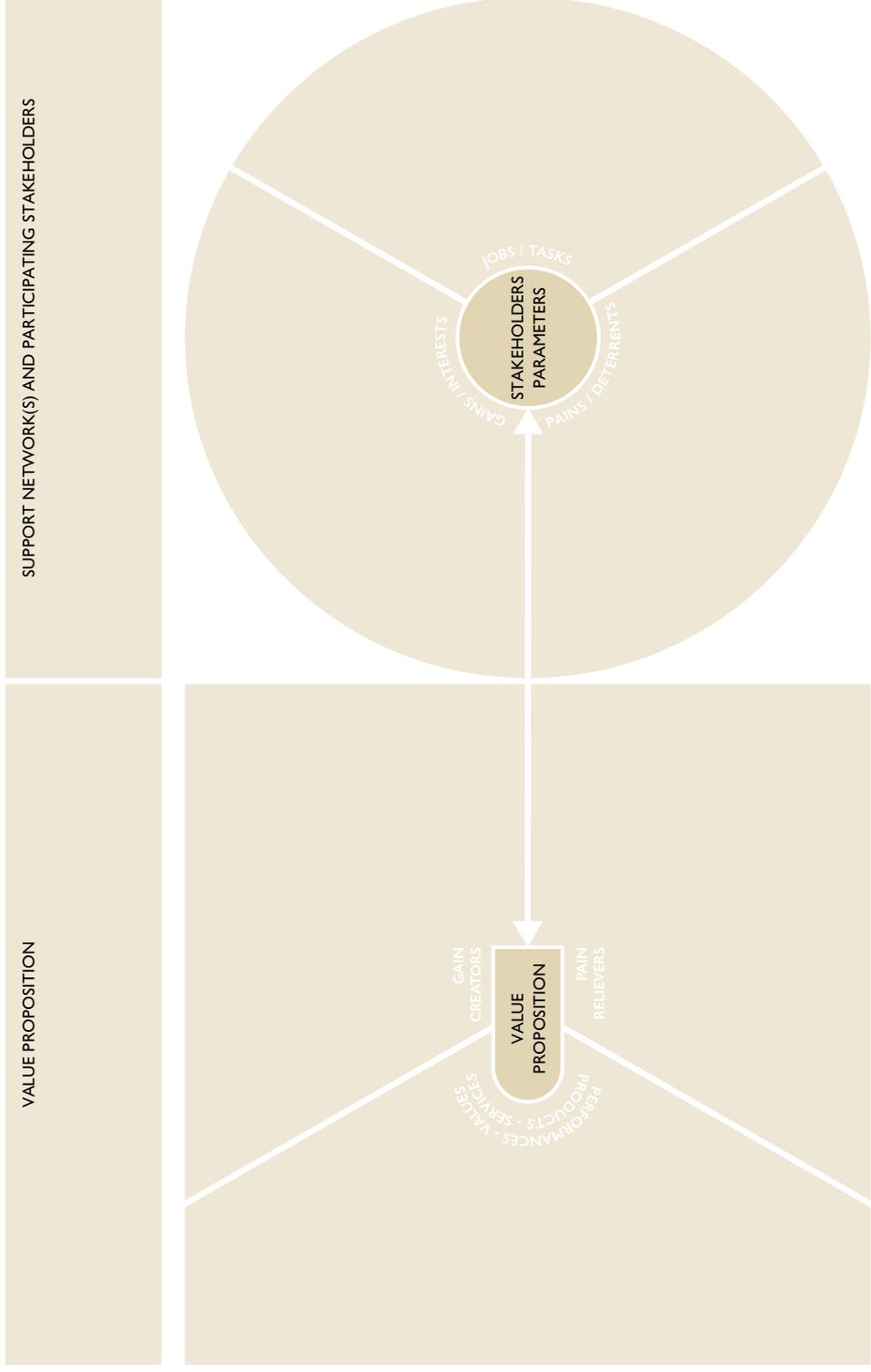
Document C2b:
The adaptive reuse architectural Value Proposition Canvas (aVPC)

A.R. MANAGERIAL VALUE PROPOSITION CANVAS



Document C2c:
The adaptive reuse amanagerial Value Proposition Canvas (mYPC)

A.R. ENTREPRENEURIAL PROPOSITION CANVAS



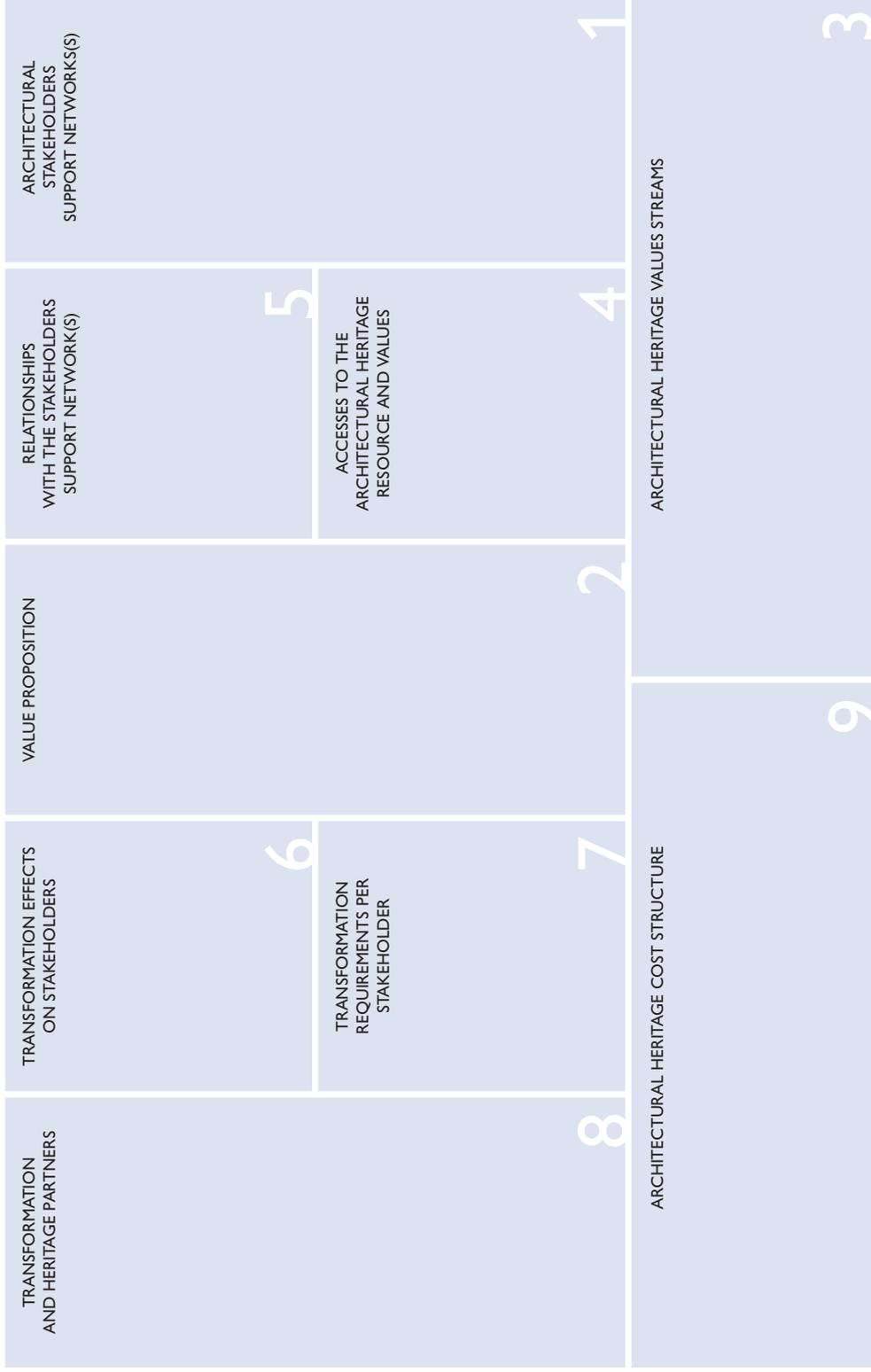
Document C2d:
The adaptive reuse entrepreneurial Value Proposition Canvas (eVPC)

A.R. BUSINESS MODEL CANVAS

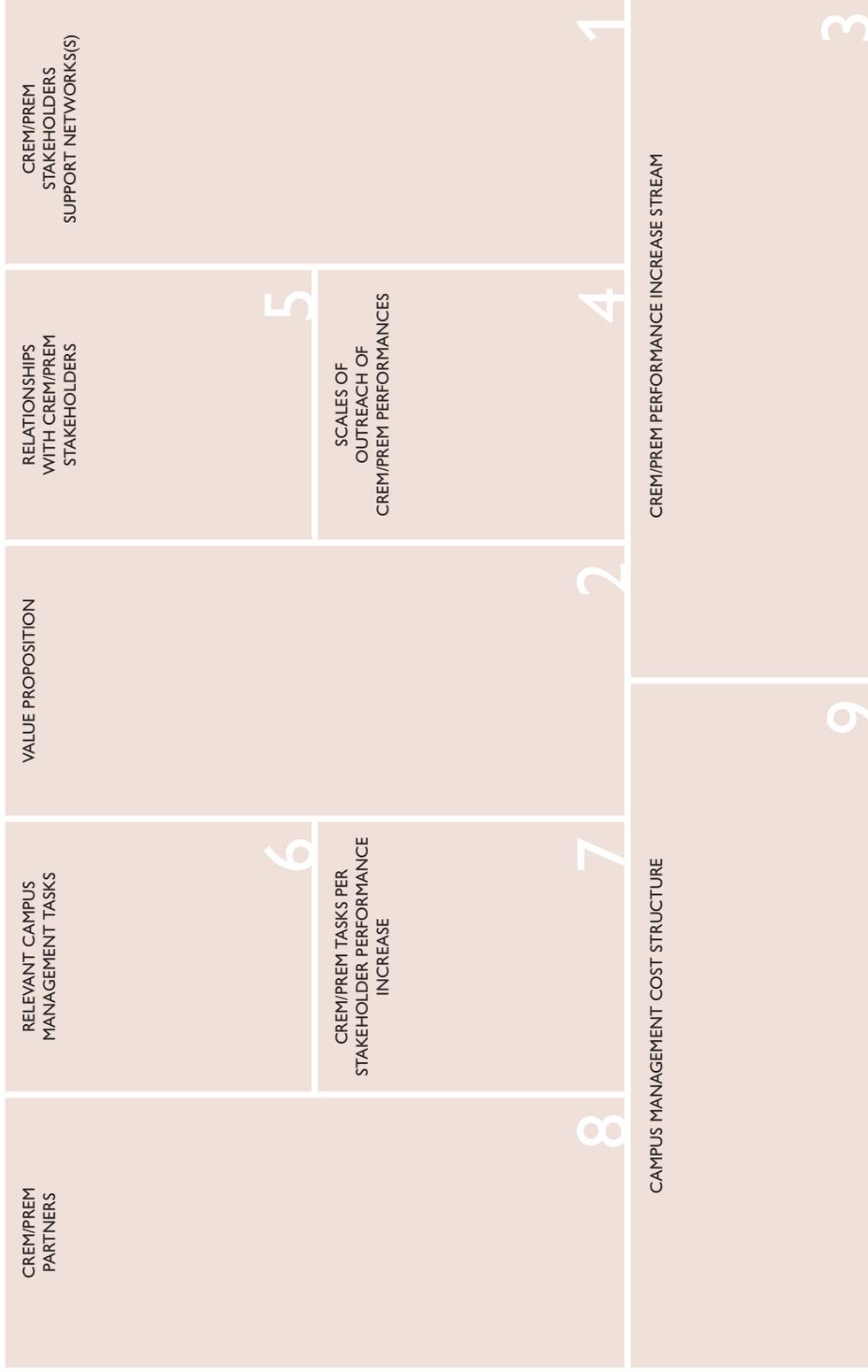


Document C3a:
 Guide to the compilation of the adaptive reuse Business Model Canvases

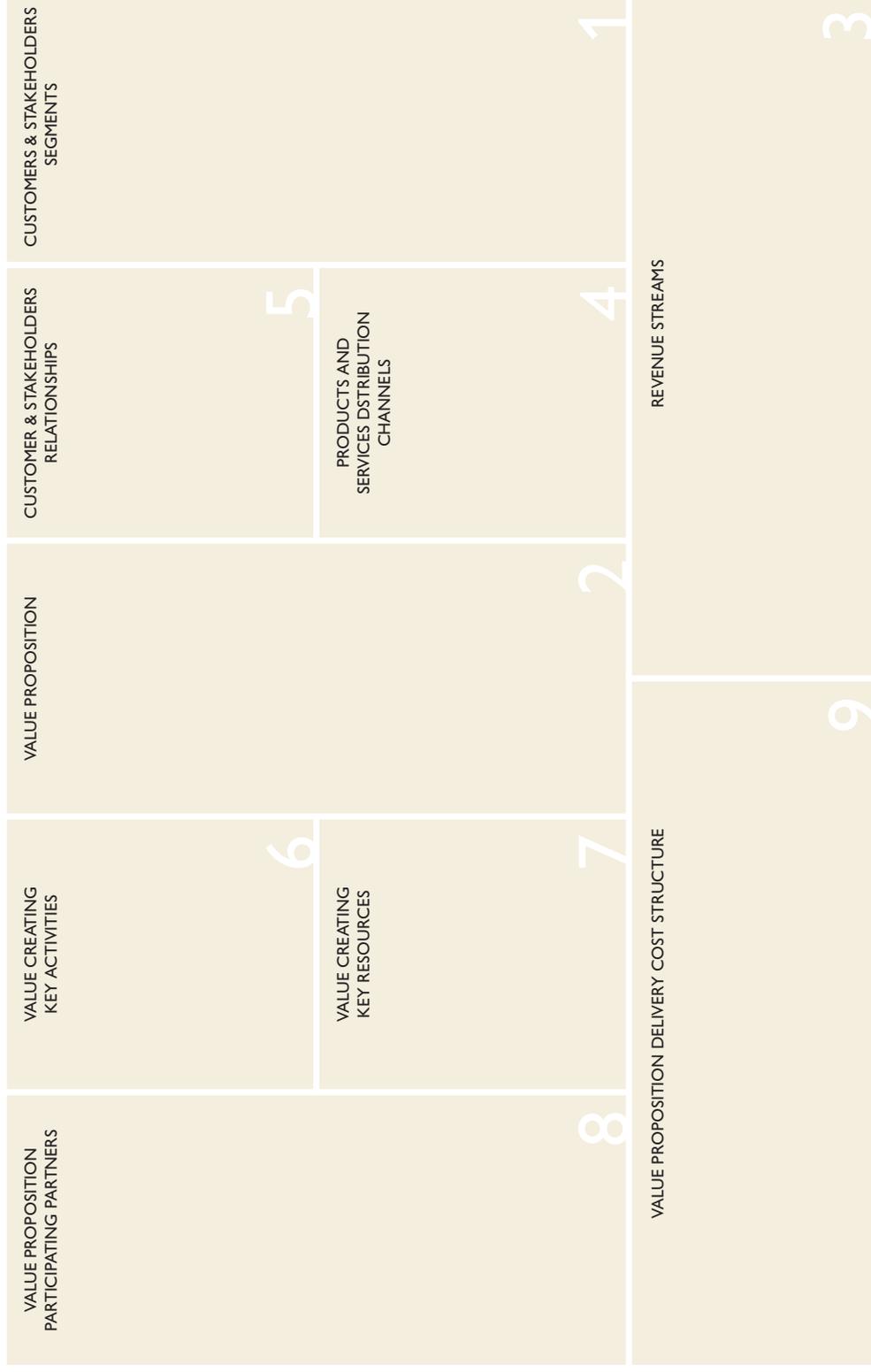
A.R. HERITAGE BUSINESS MODEL CANVAS



A.R. MANAGERIAL BUSINESS MODEL CANVAS



A.R. ENTREPRENEURIAL BUSINESS MODEL CANVAS



APPENDIX D: ARCHITECTURAL HERITAGE DOMAIN TOOLS

This appendix contains the reference tools for the architectural heritage domain to be employed throughout adaptive reuse operations in order to map the heritage values and relevant history and conditions. This is done in the perspective of their employment for the determination of the adaptive reuse transformation architectural design in relation to its former and new functions and of the restoration, preservation and enhancement of the heritage's tangible and intangible meanings. These tools are:

- D1a: Guide to the categories of the heritage values within the heritage matrixes;
- D1b: Guide to the scales of the heritage values within the heritage matrixes;
- D2: The Heritage Value Matrix (HVM);
- D3: The Heritage Significance Matrix (HSM);
- D4: The Design Themes Matrix (DTM).

These documents are (partially) adapted from their original version (see relevant sections in chapters 3 and 4). They are intended to be employed to summarize and verify the architectural heritage domain information and to facilitate the inclusion of data coming from other domains. Additionally, they can be concurrently employed to define the final intervention design embodying the adaptive reuse transformation of the heritage. Documents D1a and D1b explain the mapping criteria (value categories and value scales) by which to organize the heritage values before mapping them in the template of documents D2, D3 and D4. All of the documents can possibly be implemented dependently on the specificity of the intervention and on the necessities of the project/process managers or of the subject in charge of coordinating the operations.

Document D1a:
Guide to the categories of the heritage values within the heritage
matrixes

ORGANIZATION OF RIEGL'S VALUES						
INTRINSIC			EXTRINSIC			
KAIROLOGICAL	SUBSTANTIAL	CONTEXTUAL	OPPORTUNITY	PROJECTED	COLLECTIVE	EVOCATIVE
AGE RARIETY	ARCHITECTURAL ARTISTIC SCIENTIFIC TECHNICAL NEW-NESS	LANDSCAPE LOCAL DISTINCTIVENESS TOWNSCAPE	ECONOMIC POLITICAL USE	CULTURAL EDUCATIONAL EMOTIONAL SOCIAL NON-DELIBERATE COMMEMORATIVE RELATIVE AESTHETICAL	ASSOCIATIVE PUBLIC HISTORIC	RELIGIOUS DELIBERATE COMMEMORATIVE SYMBOLIC

Document D1b:
 Guide to the scales of the heritage values within the heritage
 matrixes

ORGANIZATION OF BRAND'S SHEARING LAYERS									
URBAN SCALE	BUILDING SCALE				INTERIOR SCALE			INTERACTION SCALE	
SURROUNDING	SITE	SCHEME	SKIN	SERVICES	SPACEPLAN	SURFACES	STUFF	SELF	SPIRIT OF PLACE
SURROUNDING SETTING SUN	SITE SOIL STREET SCENERY	SCHEME SHAPE STRUCTURE	SKIN SPACE	SERVICES	SPACEPLAN	SURFACES SPATIAL ARRANGEMENT	STUFF SYSTEM SENSES	SELF SENSATIONS SUGGESTIONS	SPIRIT OF PLACE

HERITAGE VALUE MATRIX

HVM	KAIROLOGICAL	SUBSTANTIAL	CONTEXTUAL	OPPORTUNITY	PROJECTED	COLLECTIVE	EVOCATIVE
SURROUNDING							
SITE							
SCHEME							
SKIN							
SERVICES							
SPACEPLAN							
SURFACES							
STUFF							
SELF							
SPIRIT OF PLACE							

LEGEND

LOW THREAT RISK

The low threat category (green color) is assigned to the values that appear intact and easily recognizable during the analysis of the heritage and that are likely not to be endangered if not directly affected by the transformations.

MODERATE THREAT RISK

The moderate threat category (yellow-orange color) is assigned to the values that appear impaired or of not immediate recognition during the heritage analysis. Transformation targeting this values should be carefully evaluated before being enacted.

ELEVATE THREAT RISK

The elevate threat category (red color) is assigned to values at high risk of loss independently from their consideration within the intervention extents and from the intervention actuation. It is strongly suggested to take immediate action for their preservation, restoration or enhancement.

VALUE SIGNIFICANCE MATRIX

VSM	KAIROLOGICAL	SUBSTANTIAL	CONTEXTUAL	OPPORTUNITY	PROJECTED	COLLECTIVE	EVOCATIVE
SURROUNDING							
SITE							
SCHEME							
SKIN							
SERVICES							
SPACEPLAN							
SURFACES							
STUFF							
SELF							
SPIRIT OF PLACE							

LEGEND

LOW SIGNIFICANCE

The low significance category (green color) is assigned to those values whose qualities are less relevant to the transformation purposes or rare within the specific campus type. These values contribute to determine the identity of the campus within its particular campus type.

MODERATE SIGNIFICANCE

The moderate significance category (yellow-orange color) is assigned to values whose quality assume a particular relevance for the transformation and for the campus specimen within its type. These values contribute to distinguish the campus among the others within its particular campus type.

HIGH SIGNIFICANCE

The high significance category (yellow-orange color) is assigned to the values with an outstanding level of relevance to the transformation or with unique properties. These values have a flagship meaning to the identity of the campus and should be therefore preserved, restored or enhanced by the transformation.

DESIGN THEMES MATRIX

DTM	KAIROLOGICAL	SUBSTANTIAL	CONTEXTUAL	OPPORTUNITY	PROJECTED	COLLECTIVE	EVOCATIVE	LEGEND
SURROUNDING								
SITE								
SCHEME								
SKIN								
SERVICES								
SPACEPLAN								
SURFACES								
STUFF								
SELF								
SPIRIT OF PLACE								

HARMONY
OPPOSITION

MAIN PROJECT THEMES

The different colors define the groups of values that will be particularly considered in the definition of the main themes of the architectural design transformations. The location of the values within the matrix describes at what level (intrinsic or extrinsic) and at what scales (urban, building, interior or interactive) the themes will majority contribute in the definition of the qualities and of the identity of the campus consequently to its transformation.

For each value or group of values, the dilemma is defined in terms of partial/complete harmony (black text) or partial/complete opposition (red text).

Within each main project theme, darker shades identify those values that are either recovered (if lost) or created (if absent) through the integrated heritage intervention.

