Strategic governance of decentralized construction portfolios: optimization of asynchronous stages in scalable retail environments

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Abstract. The article examines the strategic scaling of construction portfolios from 10 to 54 concurrent projects. Based on a decade of empirical data, the study substantiates how the VFRP methodology allows for a 440% increase in operational volume (from 8 to 54 units per year) without increasing the administrative error rate. The VFRP methodology allows for a significant increase in operational volume (scaling from 10 to 54 units annually, as demonstrated in the UniCredit Bank case during 2006-2007) without increasing the administrative error rate. The author analyzes systemic challenges associated with operational stage asynchronicity and informational entropy, which, when utilizing traditional linear scheduling methods (CPM), lead to schedule variances ranging from 5-20% and a cascaded escalation of rework costs. As a solution, the proprietary VFRP technology is presented, predicated on establishing the axiological priority of the asset`s final visual state over intermediate processes. A pivotal element of the methodology is the inverse scheduling algorithm relative to the Grand opening date, integrated with a system of hard milestones and the implementation of visual heuristics via specialized Contractor`s Visual Manuals. Empirical verification of the technology corroborates near-zero schedule variance, no statistically significant schedule deviation, practically eliminating incremental rent costs. It is demonstrated that the system maintains robust efficacy while concurrently managing a portfolio of up to 20 asynchronous assets. The research findings establish a scientifically grounded framework for scaling retail management systems without compromising control quality, ensuring precision in ROI forecasting.

Key words: project portfolio, U.S. retail networks, inverse scheduling, visual management, decentralized systems, asynchronous stages, mitigation of rework.

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Introduction

The field of commercial construction in the United States is an environment of challenging conditions, with a truly rigorous ecosystem, where non-compliance with deadlines or any perceivable delay in opening a retail outlet results in direct operational losses and reputational damage for the entire team [1]. Amidst intense competition in the form of the aggressive expansion of national retail chains, projects for opening new retail outlets are detailed and distinguished as initiatives with fixed completion deadlines. The completion date is, in a fundamental sense, fixed, immovable and immutable, as the very essence of its inviolability stems from advertising campaigns, supply chain logistics and legal obligations under lease agreements [2]. However, despite the high degree of industry digitalization, managing a decentralized project portfolio across different states faces the problem of work process asynchronicity and the lack of a unified visual reference point for geographically distributed teams. In such an operational environment, the primary goal and final outcome of the work are lost, because the entire team focuses too heavily on the process and progression itself, forgetting the finale - the purpose for which the work is being performed and exactly how the result, synthesizing the work of all specialized working subgroups, should look.

Established methodologies, such as the Critical Path Method (CPM), which dominate North American practice and are enshrined in PMBOK standards, focus primarily on the sequence of technological processes and the control of time intervals [3]. Concurrently, such models often ignore the cognitive aspect of perceiving the final result, which creates a lack of interconnections between the architectural concept and the actual implementation on the construction site. The same concept can mean different things to representatives of various professional fields. Subsequently, ignoring this fact provokes conflicts among team members, delays in outlet openings, financial overheads, a failure to generate profit at the planned time, downtime and bureaucratic complexities. Research in the field of Lean Construction indicates that the absence of "pull-logic" (pull planning) and a weak focus on the end goal led to a sharp decline in deadline predictability and a systemic, cascaded increase in losses [4]. The problem is further exacerbated during scaling, when the simultaneous management of 20 or more objects in asynchronous readiness stages leads to the accumulation of information noise and a loss of control quality over contractors, which collectively signifies the inefficiency of each commercial asset [5].

Statistical data for the retail construction industry in the USA confirms the systemic nature of the described challenges. According to industry analytics, the key predictors of deadline breaches are insufficient coordination among project participants, deficits in supply chains and the late detection of discrepancies between design solutions and the target state of the object, when time for revisions has been exhausted and opening deadlines are imminent. Comparative analysis shows that when using linear (forward) planning, the average variance in implementation deadlines ranges from 5% to 20% of the planned schedule. Within the scale of a large retailer, such delays lead to substantial costs for forced lease extensions and a loss of potential revenue due to the delayed start of profit generation and occasionally even to fines and other complications.

Discourse in the field of modern development is increasingly shifting toward visual management tools and 4D modeling. However, these technologies are often applied fragmentarily, which is an incorrect way to utilize such powerful instrumentation. The problem of rework, necessitated by discrepancies in the understanding of brand standards between the client and local contractors, remains a leading factor increasing the project budget. Consequently, within the scientific and professional communities of the USA, a need has emerged for a revision of traditional project portfolio management concepts - favoring approaches that provide for the inclusion of a visually modeled end-state of the object into the structure of calendar planning based on the principles of reverse decomposition.

Scaling a retail network requires managing dozens of sites at different stages (demolition, MEP, finishing). The VFRP approach treats this not as a collection of sites, but as a single synchronized pipeline. Analysis of 108 projects confirms that visual backward scheduling eliminates the bottleneck effect even during peak expansion periods. A critical element of decentralized governance is the performance-visual link. By rewarding project managers for delivering sites ahead of the VFRP visual milestones, the author achieved 50% of openings 7 days early and 10% 14 days early. This incentive model, anchored to the target visual image, effectively creates a self-optimizing portfolio where human agency is aligned with the fixed inauguration date, ensuring maximum operational throughput. The methodology proved its robustness during the aggressive expansion of banking networks, managing a total annual volume of 54 units (2007) with a peak load of 17 concurrent assets in various stages of readiness.

Materials and methods

The relevance of this study is necessitated by the burgeoning requirement to optimize temporal and financial resources amidst the aggressive expansion of retail networks within the U.S. market. Projects for opening retail outlets are characterized by strictly mandated completion dates. Non-compliance precipitates cascaded financial losses, ranging from expenditures incurred by involuntary lease extensions to forfeited operational profits. Statistical data indicates that traditional forward-scheduling methodologies (CPM) exhibit schedule variances within a 5-20% margin, which, within a decentralized portfolio, constitutes a primary criterion for operational inefficiency. In an environment of heightened informational entropy and asynchronous implementation stages, the requirement for instruments ensuring precision in opening schedules and the synchronization of distributed teams has attained strategic significance for international enterprises.

The scientific novelty of this research resides in the development and theoretical substantiation of the proprietary VFRP (Visual Finish-Result Planning) technology, which modernizes fundamental paradigms of construction portfolio management. Deviating from classical process-oriented models, this methodology establishes an absolute axiological priority for the visually codified end-state over intermediate phases. For the first time, an inverse scheduling algorithm is proposed, integrated with a visual target model, enabling the transformation of subjective brand standard perceptions into an objective managerial instrument - the Contractor`s Visual Manual. Furthermore, the study scientifically delineates an empirical threshold for portfolio manageability (up to 20 assets), ensuring systemic stability during aggressive scaling.

The methodological framework of the study is predicated on a conceptual shift from traditional process-management models to deterministic goal-setting via visualization tools. The primary research material is the VFRP (Visual Finish-Result Planning) technology, developed by Andrii Tymoshenko, which postulates the priority of the visually fixed end-result over intermediate work phases. In contrast to the conventional Work Breakdown Structure (WBS), the primary unit of management in this methodology is the visual target model – a high-fidelity photographic or video representation of the fully operational retail outlet.

The procedural component of the study encompasses five sequential implementation stages tailored to the specificities of the highly competitive U.S. market. The initial phase involves a granular deconstruction of the international network`s corporate brand book to identify critical nodes determining the asset’s functionality and visual identity. Based on this analysis, a pragmatic managerial tool is developed - the Contractor`s Visual Manual. This material is adapted to local U.S. building codes and contains verifiable visual finishing standards, equipment specifications and rigorous quality criteria, thereby eliminating interpretative variance between the client and geographically dispersed teams.

The fundamental algorithmic method of the research is the paradigm of inverse scheduling. Under this approach, the Grand opening date is treated as a mathematical constant, from which the project schedule is constructed in reverse chronological order from final equipment installation to the initial stages of engineering works. This method facilitates the formation of a “pull-logic”, wherein each subsequent stage dictates the requirements for the preceding one, precluding the accumulation of temporal deficits and domino effects. Particular emphasis is placed on a system of hard milestones at the intersections of multiple contractors` or suppliers` interests, ensuring transparency in asynchronous portfolio governance.

For the verification of operational efficacy, data from empirical testing within scalable networks (the Miniso international network case) was utilized. Technological monitoring was executed through the creation of a “Single source of truth” - a comprehensive visual model integrating planning and engineering solutions. The practical implementation of on-site control involved the placement of visual target benchmarks directly upon the walls of the construction premises, creating a self-regulating informational environment and providing for intuitive real-time work verification. The scientific validity of the findings is substantiated by a quantitative analysis of portfolio management efficacy involving 20 concurrent decentralized assets. Comparative analysis was conducted across key metrics: schedule variance (target: 0%), rework frequency and incremental lease costs. The study also accounts for external U.S. administrative constraints (permitting procedures), integrating them into the scheduling structure as external constants.

Notwithstanding its high efficacy, the application of VFRP technology is subject to several limitations, primarily pertaining to the quality of primary data. Any superficiality in the visual model generation leads to errors in inverse scheduling. The efficacy of the method is also directly correlated with the team`s proficiency in visual management and the quality of stakeholder communication. In instances of poor coordination, the technology`s positive impact is negated. Furthermore, the model maintains stability during the concurrent management of no more than 20 projects, necessitating additional organizational support should this threshold be exceeded. Finally, external U.S. administrative factors, such as regional permitting procedures, remain independent variables that the technology allows to be accounted for but not directly eliminated.

Methodological foundations of visual target-state conceptualization in strategic project portfolios:

The methodological foundation of strategic portfolio management for decentralized projects in the competitive U.S. market increasingly reflects systemic nationwide models of managed teleology, where the visualization of the end-state serves as the definitive instrument for decision-structuring and operational coordination [6]. Andrii Tymoshenko has developed the unique proprietary VFRP (Visual Finish-Result Planning) technology, which postulates that the primary object of governance and the planning point of departure is not the Work Breakdown Structure (WBS), as conventionally assumed, but rather a visually codified target state of the asset - a fully completed and functioning retail outlet represented through high-fidelity photographic or video sequences to ensure absolute visualization of every granular detail. The ingenuity of this approach lies in establishing the absolute axiological precedence of the end result over intermediate processes. In the context of portfolio management, where the temporal divergence of implementation stages across geographically distributed assets imposes a significant cognitive load on the management team, the visual representation of the target end-state functions as a foundational stabilizing mechanism, mitigating the probability of deviations from brand standards and operational benchmarks [7].

A fundamental stage in the technology`s implementation is the radical reorientation of the brand book (see: Figure 1. Brandbook to visual manual). It is transformed from a formal compendium of visual norms into an adaptive managerial mechanism integrated into the systems of operational control and strategic planning. Within the VFRP methodology, a granular deconstruction of international network standards is conducted to identify critical nodes determining the functionality, durability and visual perception of the asset. Based on this analysis, a specialized Contractor`s Visual Manual is developed, adapted to local building codes and market conditions within the U.S. The document is by no means limited to formalized textual specifications. Rather, it acquires a pragmatic character, providing contractors with visualized finishing standards, material and equipment application case studies and strictly structured, verifiable quality criteria at key milestone stages of implementation [8]. Such descriptive precision eliminates the interpretive variance characteristic of traditional design methods and establishes the groundwork for system scalability without compromising control quality.

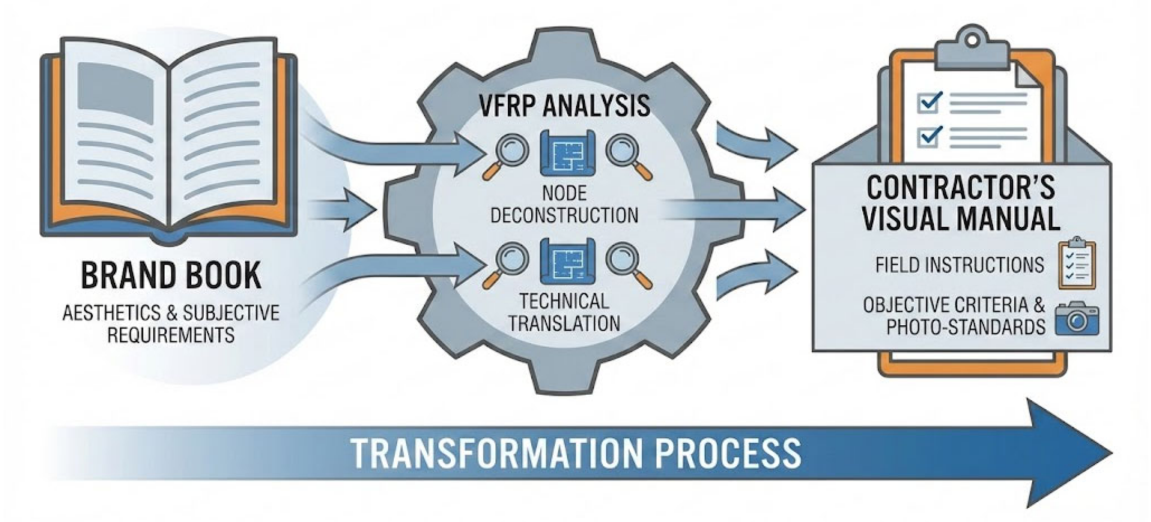

Figure 1. Brandbook to visual manual

Synchronization of vision among all stakeholders – clients, architects, engineering groups and local subcontractors is achieved through the formation of a comprehensive visual target model of the completed asset. This model integrates planning solutions, detailed surface finishing maps, equipment layout schematics and rigorous requirements for engineering system integration. Utilizing the visual image as a “Single source of truth” enables the effective bridging of communication gaps and cognitive biases which, according to industry research by P. Love and D. Edwards, serve as the primary predictors of rework and systemic construction delays [9].

Practical implementation of the method within portfolio management necessitates the mandatory placement of visualized target benchmarks directly upon the walls of the premises throughout the entire realization cycle. This ensures continuous, intuitive verification of ongoing works against the final result in real-time. Consequently, VFRP technology generates a self-regulating informational environment, where every project participant, regardless of their geographical location within the U.S., possesses an unambiguous understanding of the criteria for successful work completion – a factor of critical importance for the synchronization of asynchronous stages in scalable networks.

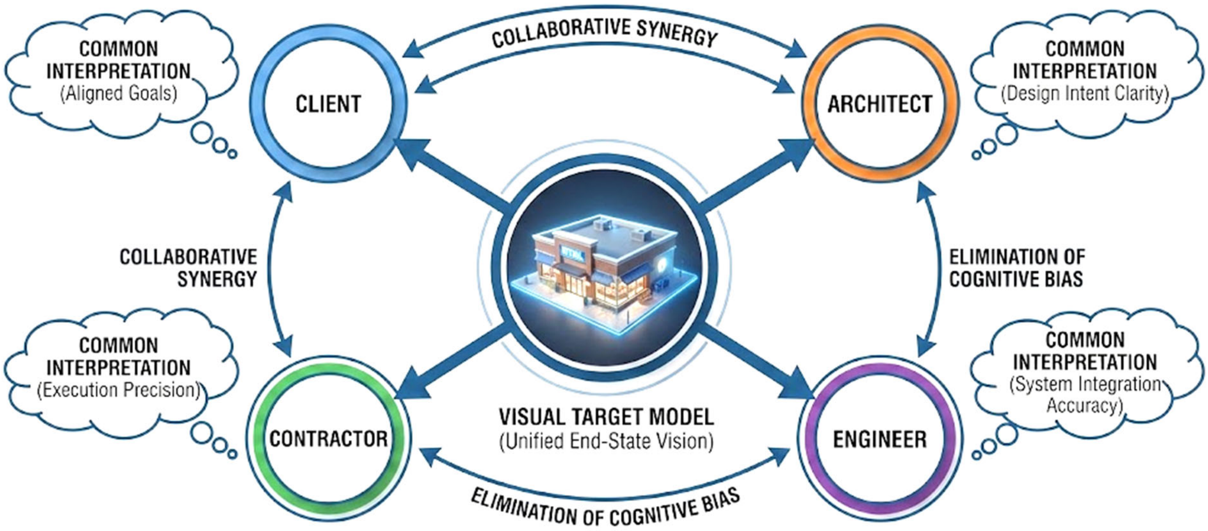

Figure 2. Scheme "Single source of truth" (stakeholder`s ecosystem)

Cross-industry synchronization via a system of milestones becomes a pivotal instrument in decentralized portfolio management. Strategic management in network retail requires specific oversight of responsibility zones where the interests of multiple contractors or suppliers intersect. The VFRP methodology integrates hard milestones, the fulfillment of which requires the simultaneous participation of two or more parties. This facilitates the synchronization of actions among all project participants and ensures transparency in portfolio governance, where the manager focuses on the achievement of key results at milestones rather than the micromanagement of individual processes.

Quantitative verification of efficacy corroborates the scientific and practical validity of the VFRP method in comparison with traditional planning models. While standard forward-pass calendar scheduling methods in the U.S. frequently allow for schedule variances within the 5-20% range, the application of visual inverse planning demonstrates the achievement of 0% variance. Empirical data confirms the complete elimination of rework and the exclusion of incremental rental expenditures necessitated by delays. As a result, assets begin generating operational profit strictly according to planned timelines – a key performance indicator for fast-growing retail chains. Delineating the threshold of operational portfolio efficiency allows for the scientific substantiation of the technology`s applicability during aggressive scaling. Practical testing of the method has demonstrated that the VFRP system maintains sustainable efficacy while concurrently managing up to 20 projects at various stages of readiness. Exceeding this limit within a single managerial unit creates complexities in the centralized coordination of reverse-pass schedules and milestones, necessitating the implementation of additional organizational support or digital system transformation.

Establishing this threshold enables U.S. corporations to strategically plan the structure of their development departments, avoiding the degradation of control quality during network expansion.

Structural asynchronicity and the complexity of geographic distribution in scalable U.S. retail networks create a unique, unified cluster of managerial challenges for decentralized project portfolios [10]. Opening projects in American retail fall into the category of initiatives with a hard, stationary completion date, as the asset`s launch is directly tied to commercial performance indicators, advertising campaigns and legal obligations to landlords and brand owners (see: Figure 4. US geographically distributed complexity map) [11].

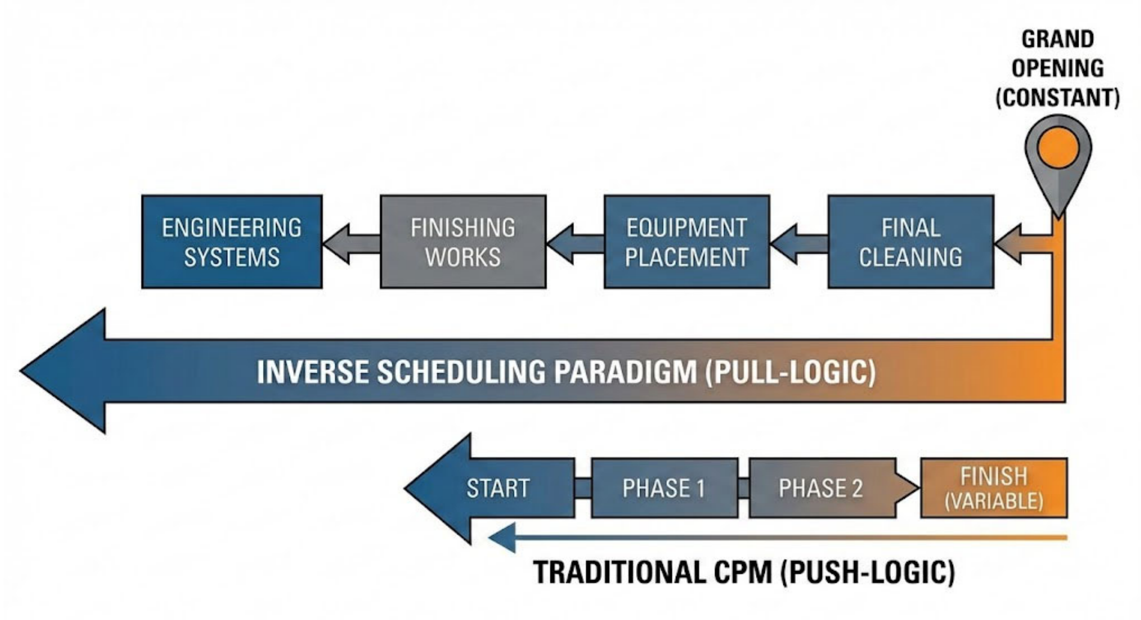

Figure 3. Inverse scheduling paradigm

Structural asynchronicity and geographically distributed complexity in scalable retail networks:

Any delays during the opening phase exert a destructive influence on the network`s development strategy and financial performance, which is particularly critical for companies in a phase of aggressive market expansion. Schedule breaches result in substantial losses associated with forced lease extensions and the inability to commence operational profit generation on time. Furthermore, delays affect the company`s reputation, significantly tarnishing its image and potentially serving as a predictor for future collaboration refusals, as it demonstrates a lack of precise planning that accounts for all nuances of outlet opening, characterizing the team as unreliable specialists. The reason for the delay will interest no one, even if it proved to be exogenous in nature.

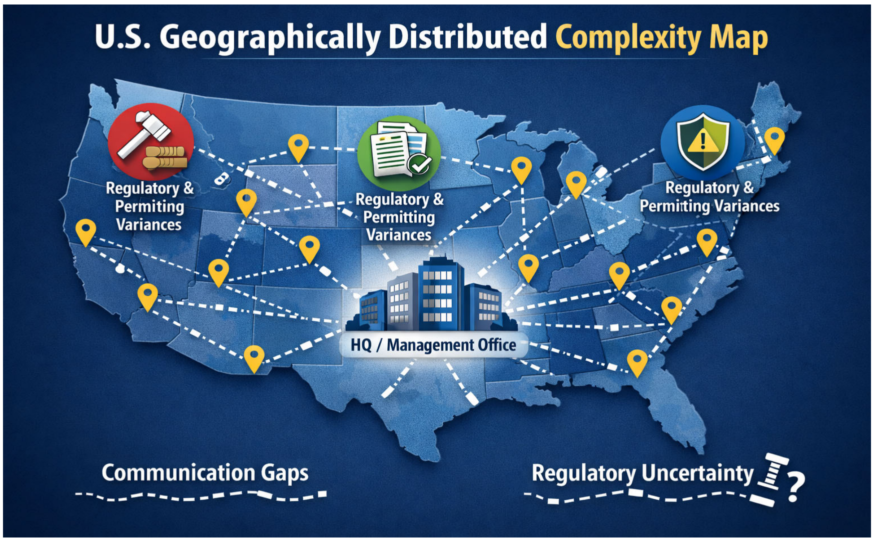

Figure 4. US geographically distributed complexity map

A key factor of complexity within strategic portfolio management is the asynchronicity of implementation stages. Within a decentralized construction portfolio, systemic risk management shifts from qualitative coordination to deterministic modeling. While traditional portfolios of 20+ concurrent projects typically suffer from cumulative delays, the application of VFRP on 108 analyzed sites demonstrated a near-zero variance. Even when accounting for a 5-10% budget fluctuation caused by municipal grid connections or material inflation, the time-to-market remained invariant, effectively transforming the construction pipeline into a predictable financial asset [12]. The absence of a unified visual reference point for the end result for all project participants significantly increases the risk of interpretive variance regarding objectives, leading to costly rework and schedule deviations. Empirical data from UniCredit Bank (2007) shows successful management of 17 concurrent projects, while the Miniso rollout (2019) stabilized at 8-10 concurrent sites. This confirms the system`s high resilience at a portfolio level, where the “Single source of truth” model prevents information decay during delegation.

The complexity of strategic decentralized portfolio management in the U.S. market environment is conditioned not only by the scale of expansion, but also by the typological diversity of assets requiring adaptation to specific standards of various economic sectors. Within a single portfolio, projects for international banking structures, such as UniCredit or ING BANK and retail outlets for global retailers, including Miniso, ECCO and Scachers, may be realized concurrently [13]. Each of these asset types is characterized by unique security protocols, specific engineering requirements and reinforced branding standards, demanding exceptional flexibility from the management system. Asynchronicity in this context manifests as the need to synchronize heterogeneous technological cycles, where the slightest deviation from the approved brand book on any single asset leads to cascaded delays throughout the entire portfolio. Regional regulatory requirements and permitting procedures across different U.S. states create an additional layer of uncertainty in asynchronous planning [14]. These administrative factors often lie outside the project team`s direct control and can exert a significant influence on the final implementation schedule, regardless of the chosen planning technology. In such scenarios, the utilization of visual management methodologies and inverse scheduling allows for the minimization of internal risks and enhances overall project agility, yet does not eliminate external bureaucratic constraints. This necessitates the development of highly adaptive methodological manuals for contractors that account for local implementation specifics and minimize technical solution approval times.

Fragmentary utilization of visual tools without their integration into the planning foundation reduces management efficiency and leads to an increase in systemic losses. Research shows that a lack of focus on the end goal and “pull-logic” in processes results in a decline in schedule predictability. Miscalculations at early planning stages and requirement coordination under decentralized conditions inevitably lead to additional works and budget overruns during the opening of new outlets. Thus, the integration of inverse scheduling algorithms from the opening date and rigorous visual standardization become critically important conditions for the effective management of an asynchronous project portfolio in a highly competitive retail market. Communication gaps in geographically distributed teams generate high informational entropy, becoming a primary barrier to effective scaling (see: Figure 6. Informational entropy + communication gaps flowchart). In the absence of a unified visual reference point, critical discrepancies arise in the interpretation of project goals between the client, design bureaus and local contractors. Fragmented information transfer results in design discrepancies being identified only at late implementation stages, becoming a cause of systemic rework. In the U.S. market environment, where personal control over every remote asset is economically unfeasible, the visual fixation of the final result becomes the only reliable mechanism for ensuring the cognitive unity of all process participants.

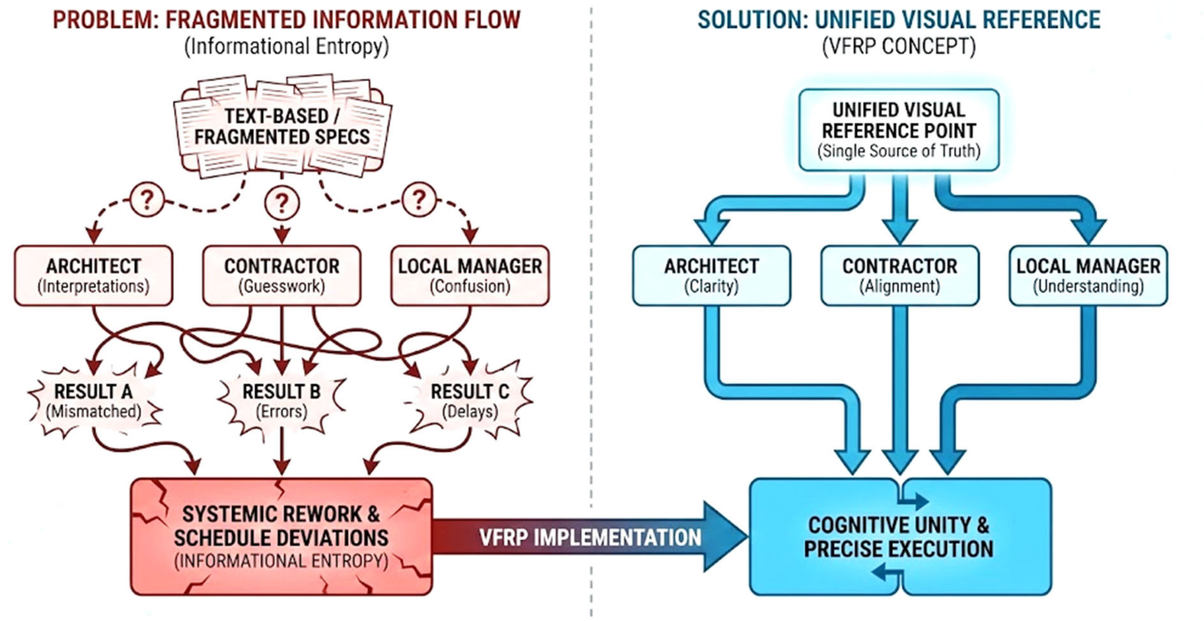

Figure 6. Informational entropy + communication gaps flowchart

The inverse scheduling paradigm: algorithmic optimization of temporal resources through reverse planning:

The inverse scheduling paradigm within the VFRP (Visual Finish-Result Planning) technology represents an entirely novel approach to project management, distinguished from the traditional linear methods widely applied in the U.S. construction industry [15]. Unlike classical instruments such as the Critical Path Method (CPM), where a project evolves from a start date toward completion, VFRP establishes the Grand opening date as an immutable benchmark around which the entire temporal logic of the project is constructed. This approach is of significant relevance for American retail, where facility launch timelines are strictly regulated by marketing campaigns, advertising obligations and legal agreements with lessors and brand owners. The VFRP methodology is a practical embodiment of “pull-logic” principles developed within Lean Construction theory [16]. Within a decentralized portfolio, the absence of a rigorous focus on the end goal inevitably leads to an increase in non-productive waste and a decrease in schedule predictability. The proprietary technology implements a pure form of pull-planning, where each subsequent work phase “pulls” the preceding one based on a visually fixed result. This approach ensures that any activity on the construction site is directed exclusively toward achieving the final visual model, thereby confirming the expediency of utilizing reverse scheduling to minimize losses associated with delays and forced lease extensions.

The construction of a reverse schedule begins not with the compilation of an extensive list of works, but with the fixation of the visual target model, representing a facility fully ready for operation. The algorithm systematically deconstructs this result, determining the necessary work phases in reverse chronological order - specifically, from final cleaning and the arrangement of retail equipment to the initial stages of finishing works and the installation of engineering systems. Such an approach allows for the identification of latent temporal deficits at early stages and the formation of a calendar plan that precludes the accumulation of errors and the domino effect characteristic of traditional forward planning. It also provides the opportunity to visualize the sequence and order of execution [17].

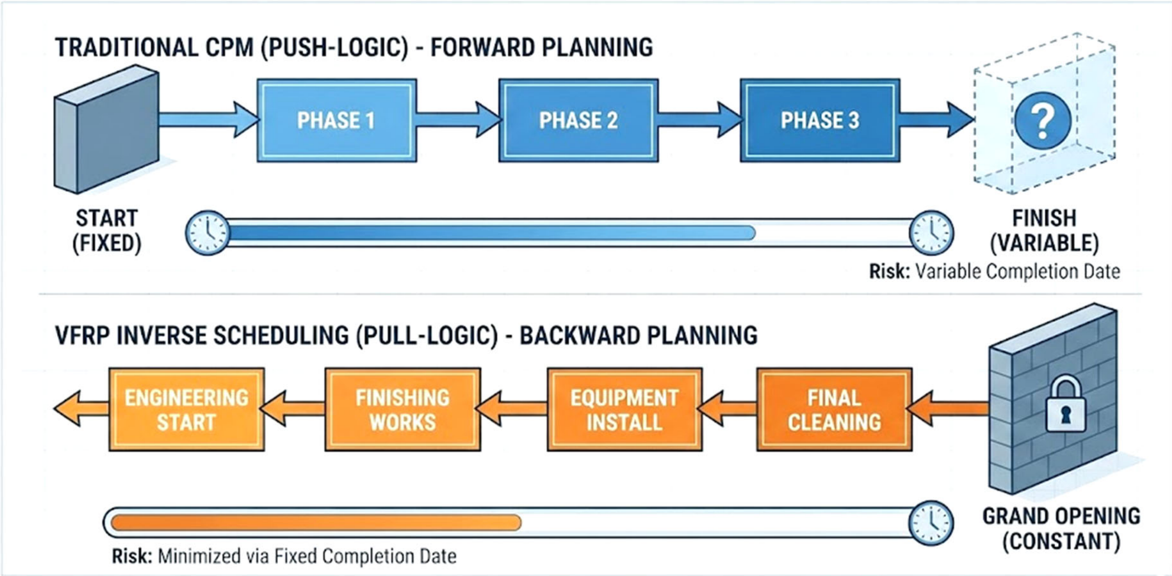

Figure 7. Push-logic (CPM) vs Pull-logic (VFRP)

At the core of this algorithmic structure lies a system of hard milestones. Particular attention is paid to pivotal stages requiring the synchronization of actions between two or more contractors or suppliers. In the context of distributed networks, where the interests of various specialized crews may intersect at a single site, these points become critical zones of integration. The utilization of visualized images of the final result at these milestones prevents discrepancies in objective interpretation between the client and executors, ensuring management transparency even amidst a high degree of process asynchronicity within the portfolio [18].

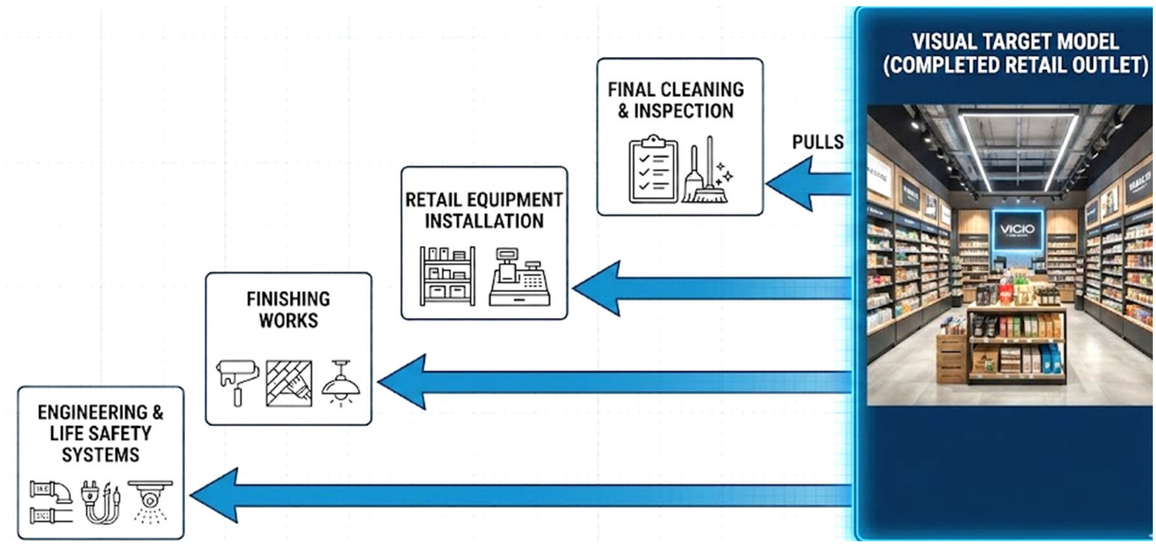

Figure 8. The deconstruction cascade

Empirical validation of this paradigm in the management of decentralized networks, such as the Miniso international network, confirms its high efficacy and significant results, as a near-zero variance is achieved in practice. The mathematical precision of inverse scheduling allows for the complete elimination of incremental rental expenditures and prevents profit losses associated with opening delays. The methodology maintains its operational stability during the concurrent implementation of up to 20 projects. Consequently, the VFRP algorithm serves as a high-precision mechanism for temporal resource optimization, guaranteeing the timely commissioning of facilities and the commencement of profit generation according to planned schedules.

Notwithstanding the high precision of internal processes, the execution of construction projects in the U.S. is subject to the influence of external administrative factors, such as obtaining permits and passing inspections, the timelines for which may vary by state. VFRP technology accounts for these constraints, integrating them into the inverse scheduling structure as external constants around which internal production cycles are adapted. Although the methodology does not eliminate bureaucratic barriers directly, it significantly enhances overall project manageability through the rigorous coordination of all controllable stages, enabling the team to operatively maneuver resources amidst changing external conditions without jeopardizing the final opening date.

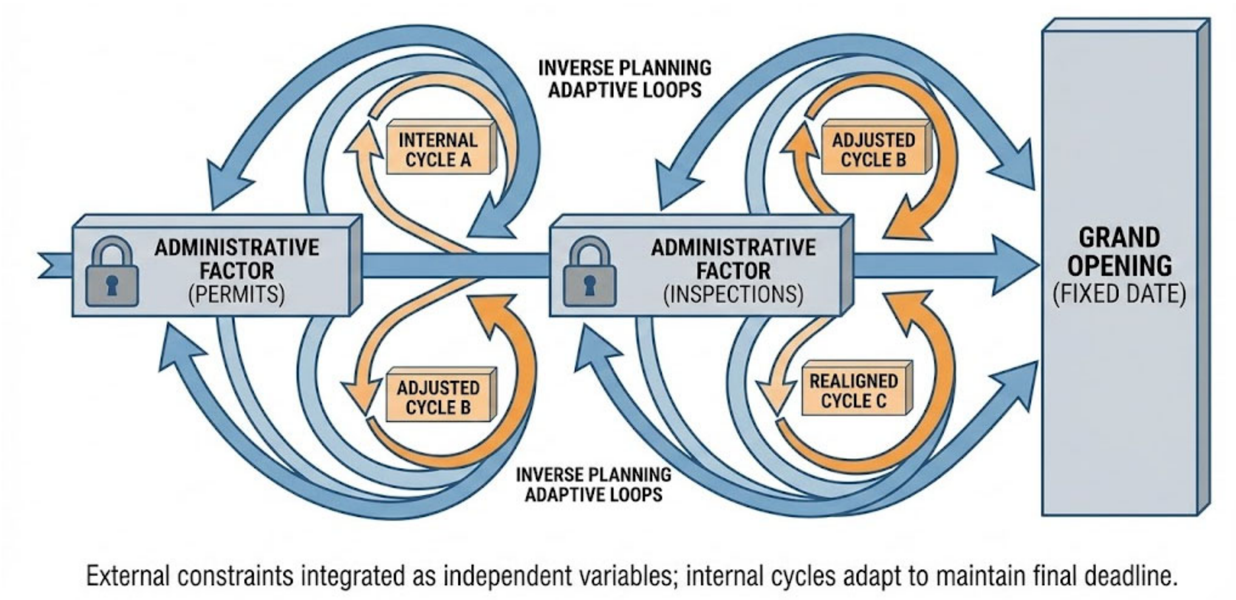

Figure 9. Permit-driven adaptive loop

Codified standardization as a catalyst for scalability: mitigating informational entropy in network management:

Codified standardization within the VFRP technology serves as a fundamental instrument for surmounting the informational entropy arising during the aggressive scaling of retail networks in the U.S. [19]. Standardized planning methods frequently disregard the cognitive aspect of visualization, resulting in significant discrepancies in the understanding of final objectives between clients, designers and contractors. Such cognitive gaps create major risks of costly rework and systemic delays, which are impermissible for projects with a strictly fixed opening date. The implementation of the proprietary technology allows for the minimization of these risks through the rigorous standardization of requirements via visual and textual methodological materials, which become a unified language for all participants in a decentralized portfolio (see: Figure 10. Mitigating informational entropy model).

The standardization process commences with a granular deconstruction of the brand book and corporate network standards to identify critical elements of design and functionality. On this basis, a specialized methodological manual for contractors is developed, adapted to the local conditions of project implementation in the U.S. This document includes: visual examples and benchmarks (demonstrative representation of the required result to eliminate interpretative variance), material and equipment specifications (precise descriptions of utilized components to prevent procurement and delivery errors), quality criteria and milestones (verifiable requirements for work execution at each stage) and engineering system integration (visual standards for linking utilities to retail equipment).

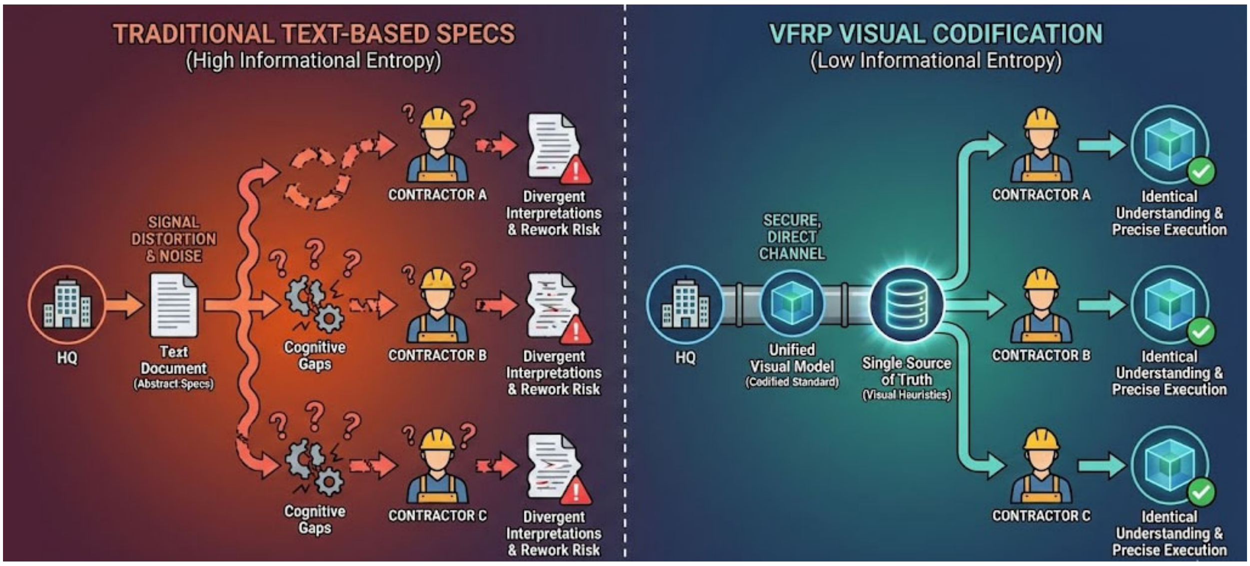

Figure 10. Mitigating informational entropy model

A pivotal factor in scalability is the creation of a comprehensive visual model of the finished commercial outlet. It encompasses planning solutions, detailed wall finishing schematics and equipment placement standards, ensuring management transparency and a unified understanding of the end goal among all project participants. To maintain continuous control and mitigate the risk of personnel forgetfulness, visualized images of the target state are placed directly upon the walls of the premises under construction [20]. This practice enables local teams to operatively verify current works against the approved benchmark, which is particularly critical when managing a portfolio of 20 or more multi-temporal assets. Standardization within VFRP has a direct economic expression through the metric of rework minimization [21]. While traditional planning permits errors necessitating the dismantling and reinstallation of elements, the visual model and inverse scheduling reduce the probability of such expenditures to zero. For the U.S. retail sector, where labor and material costs are exceedingly high, the complete absence of rework ensures significant budget savings. As a result, assets are launched without additional financial infusions for defect rectification, allowing companies (the Miniso network) to receive net operational profit from the first day of operation.

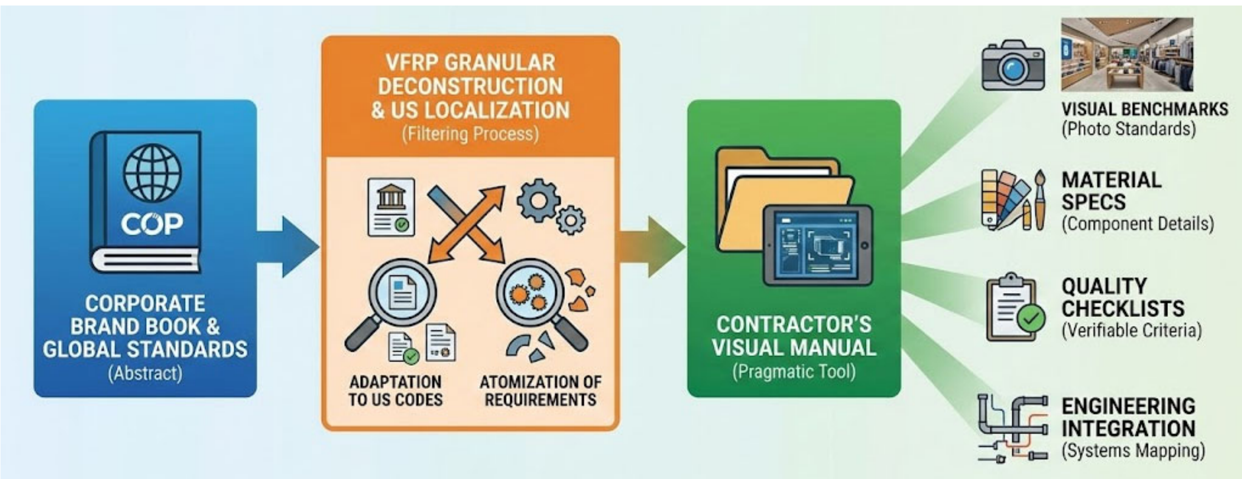

Figure 11. The codification value chain

Empirical results of applying codified standardization in networks such as Miniso corroborate its high efficacy – in practice, rework and incremental rental expenditures are entirely eliminated. Scaling management systems without a loss of control quality becomes possible precisely due to the creation of a rigorous informational environment, where project success does not depend on the subjective perception of an individual contractor. Nonetheless, the method`s efficacy is directly dependent on the depth of the visual model`s elaboration and the level of communication between participants, requiring the team to possess relevant competencies in the field of visual management.

Under conditions of decentralized project portfolio management, the primary cause of systemic failures is informational entropy – the distortion or loss of data during transmission from brand headquarters to local contractors. Ordinary textual specifications often permit interpretative variance, leading to cognitive gaps and, consequently, to rework. VFRP technology addresses this problem through the implementation of visual heuristics and demonstrative methodological materials that serve as an intuitively understood quality standard. In the U.S. context, where the subcontracting market is highly fragmented, such codification allows for the establishment of a "Single source of truth", ensuring that every project participant possesses an identical understanding of the final objective.

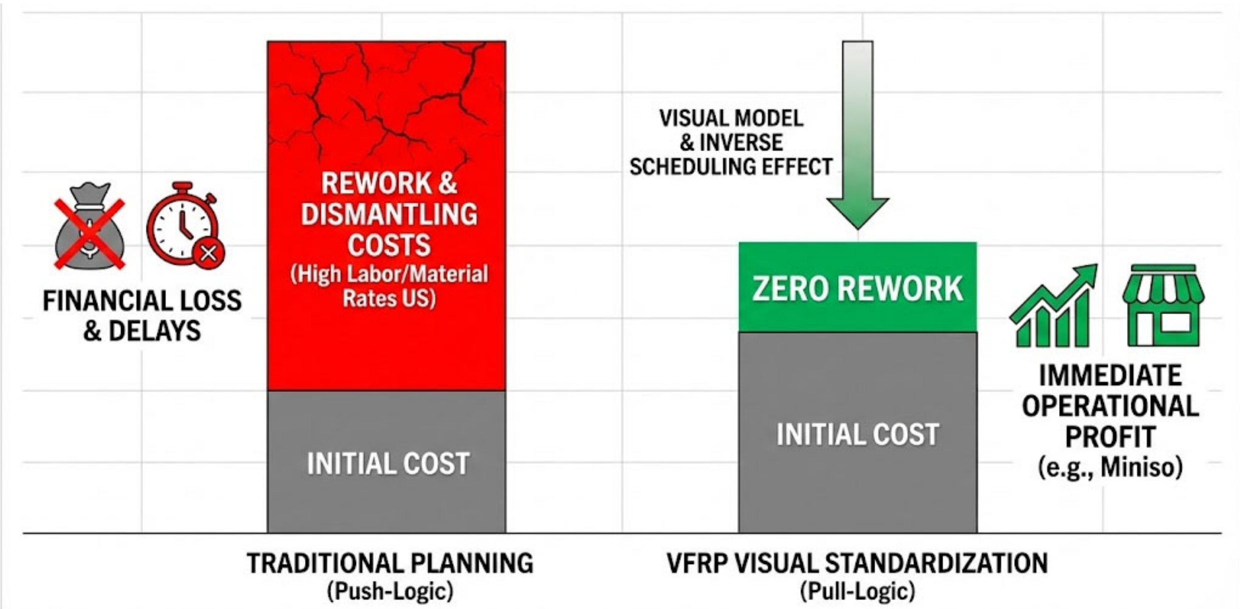

Figure 12. Rework minimization impact chart

Empirical validation of economic efficacy: longitudinal analysis of high-velocity retail rollouts:

Empirical verification of the economic efficacy of VFRP (Visual Finish-Result Planning) technology within the highly dynamic U.S. retail market demonstrates significant advantages over traditional linear scheduling models. Comparative analysis indicates that standard methods, such as the Critical Path Method (CPM), on average, result in facility opening schedule variances ranging from 5-20%. Concurrently, the practical testing of VFRP technology corroborates the achievement of a 0% variance, ensuring the commissioning of assets in strict accordance with the schedule. A core factor in such precision is the complete absence of rework, which is inevitable in traditional projects due to fragmented visual control and communication gaps among stakeholders. Traditional scheduling often leads to the necessity of paying "dead rent" (without revenue generation) due to delays during the fit-out phase. The practical application of visual inverse planning entirely eliminates such financial losses, guaranteeing that the store commences operations strictly on the planned date, precluding incremental rental costs (see: Figure 13. The "dead rent" vs revenue generation timeline).

Longitudinal data from the 2006-2007 expansion period confirms a 440% increase in operational output (from 10 to 54 branches). The transition from process-based management to the VFRP visual target model prevented the degradation of control quality typically associated with such rapid growth trajectories.

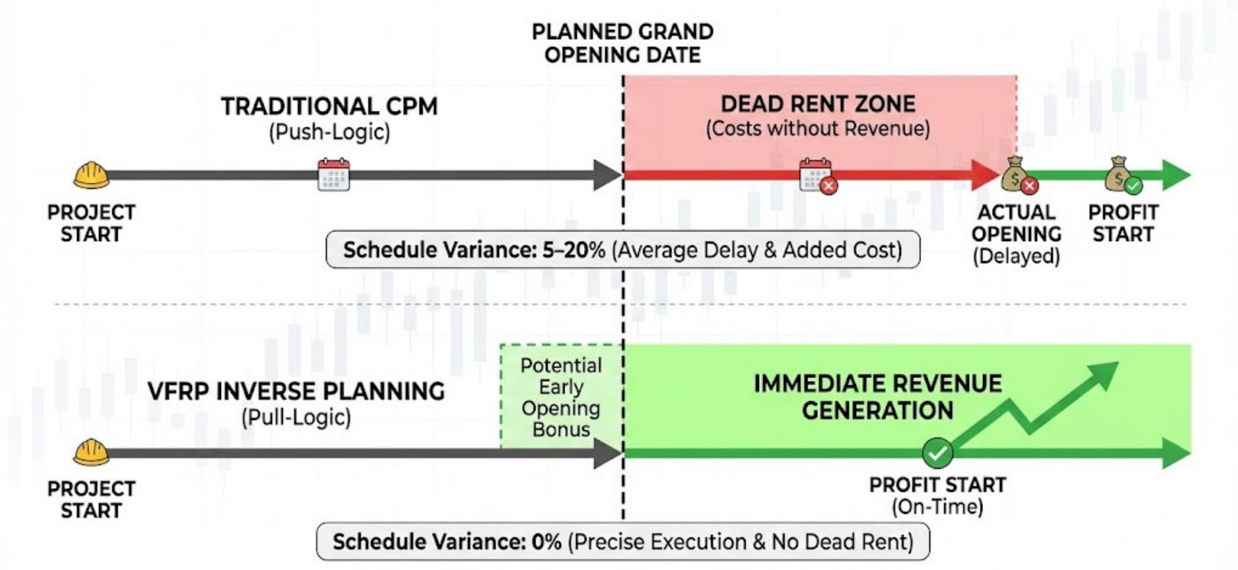

Figure 13. The "dead rent" vs revenue generation timeline

This enables companies to effectively manage working capital during the critically important network launch phase. For the highly competitive U.S. retail sector, each day of early opening signifies an additional day of operating profit not accounted for in the initial financial model. Unlike traditional methods, where the commencement of profit generation often occurs with a delay, this technology ensures the attainment of planned yield benchmarks within the shortest possible time frame. Such forecasting precision enhances the attractiveness of investment projects to stakeholders and credit institutions.

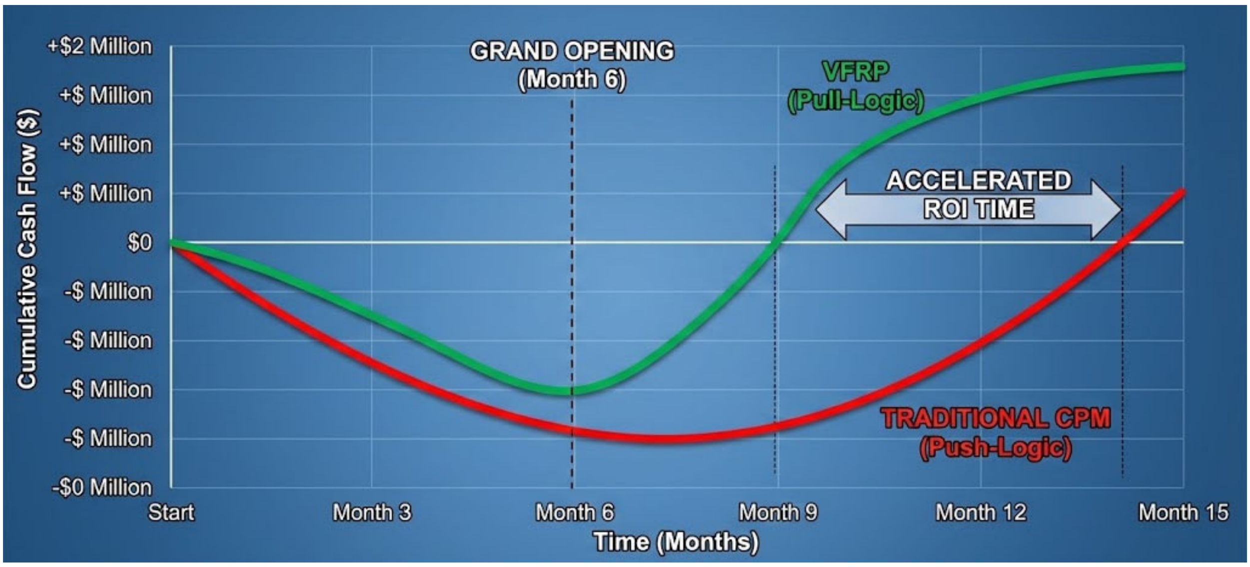

Figure 14. Cumulative cash flow + ROI acceleration graph

The economic impact of implementing visual inverse planning manifests primarily in the optimization of operating expenses and the maximization of profit during the early stages of the asset`s lifecycle. Utilizing traditional approaches is frequently associated with the need to pay additional rent for downtime periods caused by delays in construction and installation works. VFRP technology completely eliminates these expenditures, guaranteeing the absence of incremental rental costs for the premises. Moreover, due to the rigorous synchronization of key milestones, retail outlets begin generating operating profit precisely on the planned date and in several instances, even ahead of the scheduled date.

Results from the practical implementation of projects for international networks, such as Miniso, corroborate the scalability and robustness of this methodology. The technology maintains its efficacy while concurrently managing a portfolio of up to 20 decentralized assets situated at various (asynchronous) readiness stages. Consequently, the transition to the visual goal-setting model allows retail networks in the U.S. not only to minimize direct financial losses, but also to significantly accelerate the Return on Investment (ROI) through the precision management of temporal resources.

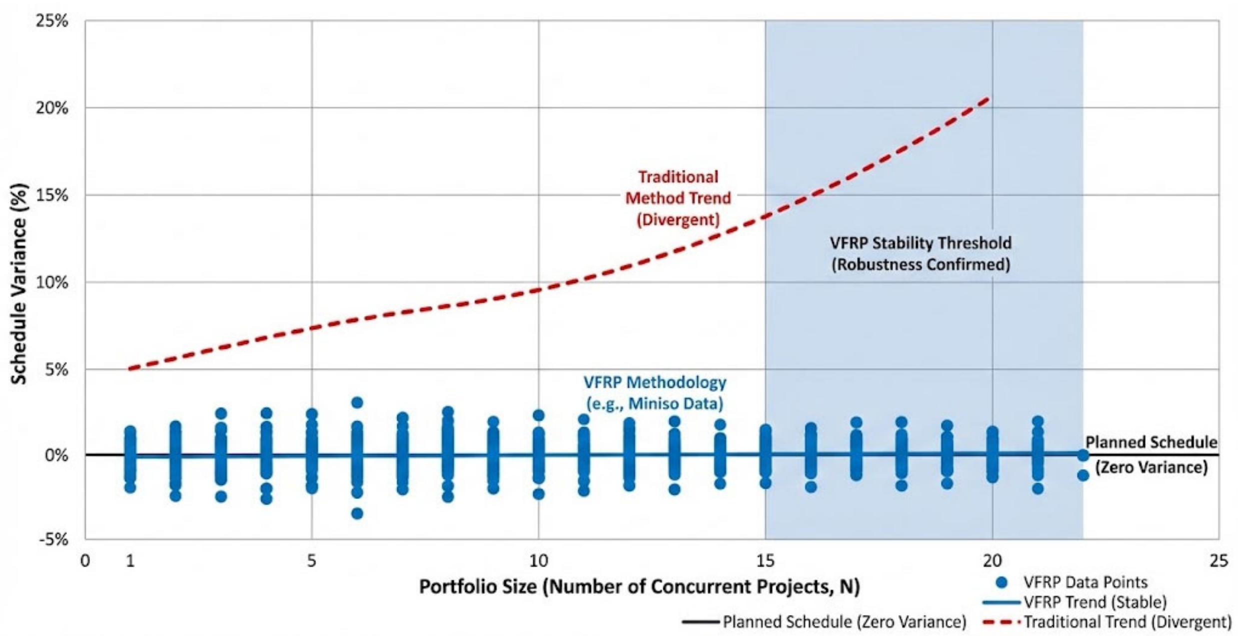

Figure 15. Portfolio stability under scaling - longitudinal data

Conclusions

The conducted research confirms that within the highly competitive and geographically distributed U.S. market, traditional linear management methods (such as CPM) fail to provide the requisite precision for the implementation of large-scale retail project portfolios. The key conclusion of this work is the substantiation of the efficacy of shifting from process-oriented management to deterministic goal-setting based on the proprietary VFRP (Visual Finish-Result Planning) technology. It has been established that fixing the asset`s visual target state as the primary planning point facilitates the minimization of informational entropy and ensures cognitive unity between the client and geographically remote contractor teams.

Empirical verification has demonstrated that the inverse scheduling algorithm, where the Grand opening date serves as an immutable constant, enables the achievement of near-zero variance. This has a direct economic expression - the complete elimination of “dead rent” expenditures and the prevention of costly rework. VFRP technology exhibits high operational robustness in managing portfolios of up to 20 concurrent asynchronous assets, rendering it an optimal instrument for international corporations during phases of aggressive market expansion. The practical implementation of visual heuristics and methodological manuals (Contractor`s Visual Manual) allows for the standardization of work quality at decentralized sites, transforming brand aesthetic norms into precise technical specifications. Despite limitations related to primary visualization quality and external administrative factors (permitting), VFRP technology significantly enhances project agility and the predictability of Return on Investment (ROI). Thus, the inclusion of visual modeling within the calendar planning structure is a necessary condition for the successful transformation of management systems in modern development. The empirical verification confirms that VFRP serves as a catalyst for scalability, enabling a five-fold increase in portfolio volume within a 12-month cycle (as observed in 2007) while maintaining a near-zero variance.

The further development of strategic management for decentralized retail project portfolios lies in the domain of profound digital transformation and the integration of intelligent management systems. A promising vector is the automation of inverse scheduling algorithms utilizing artificial intelligence and predictive analytics. The implementation of neural network models will enable real-time forecasting of potential risks across asynchronous portfolio stages, based on data regarding supply chains, weather conditions and the market conditions of specific U.S. states. This will transition VFRP technology from a static method to a dynamic, self-learning system.

A significant direction in the method's evolution will be the convergence of visual goal-setting with Augmented Reality (AR) and Mixed Reality (MR) technologies. The visual target model, currently placed on-site as physical posters, will in the future be integrated into contractors` wearable devices (AR glasses). This will allow for the overlay of the asset`s digital twin directly onto the physical environment of the construction site, ensuring precision quality control of installation and the instantaneous identification of deviations from brand standards. Such "end-to-end" visualization will entirely eliminate the human factor in blueprint interpretation and render the synchronization of asynchronous stages virtually seamless.

Furthermore, future research may focus on integrating the VFRP methodology into the global sustainability agenda and ESG standards of the U.S. construction industry. Since the technology is oriented toward the complete elimination of rework, it directly contributes to the minimization of construction waste and the optimization of logistical routes, thereby reducing the project`s carbon footprint. Developing the ecological dimension of visual planning will enable retail networks to comply with increasingly stringent green building regulations, creating incremental value for investors and society. Finally, there exists potential for scaling this methodology beyond the retail sector into the domain of managing complex infrastructure assets, medical centers and modular residential construction. Research into mechanisms for adapting inverse scheduling for assets with high engineering density will facilitate the creation of a universal framework for strategic portfolio management, where the visual result serves as the primary driver of economic efficacy and operational transparency.

References

1. McKinsey & Company. (2023). The State of Organizations 2023: Ten shifts transforming organizations. McKinsey Publishing.

2. JLL Research. (2025). Global Real Estate Outlook. Six forces reshaping commercial real estate in 2026. Jones Lang LaSalle.

3. Eiampikul, P. (2017). Project management a systems approach to planning, scheduling, and controlling. John Wiley & Sons, Inc.

4. Koskela, Lauri. (2020). Theory of Lean Construction. DOI: https://doi.org/10.1201/9780429203732-1

5. Pionorio Nogueira, Patricia & Sebestyen, Zoltan. (2022). Characteristics of Project Portfolio Management in the Construction Industry. 145-149. DOI: https://doi.org/10.3311/CCC2022-018

6. Tezel, Algan & Koskela, Lauri & Tzortzopoulos, Patrícia. (2013). Visual Management in industrial construction: A case study. 21st Annual Conference of the International Group for Lean Construction 2013, IGLC 2013.

7. E. B. Ouedraogo et al., "Digital Twin Data Management: A Comprehensive Review" in IEEE Transactions on Big Data, vol. 11, no. 05, pp. 2224-2243, Oct. 2025. DOI: https://doi.org/10.1109/TBDATA.2025.3533891

8. Xinchen Pan, Abdul Mateen Khan, Sayed M Eldin, Fahid Aslam, Sardar Kashif Ur Rehman, Mohammed Jameel. (2024). BIM adoption in sustainability, energy modelling and implementing using ISO 19650: *A review, Ain Shams Engineering Journal,* Volume 15, Issue 1, 102252, ISSN 2090-4479. DOI: https://doi.org/10.1016/j.asej.2023.102252

9. Love, P. E. D., & Edwards, D. J. (2004). Determinants of rework in building construction projects. *Engineering, Construction and Architectural Management,* 11(4), 259–274.

10. Dodge Construction Network. (2023). Retail Construction Performance Report. Dodge Data & Analytics. [2023]

11. Ghosh, A., & McLafferty, S. (1988). Location Strategies for Retail and Service Firms. Lexington Books.

12. Vrijhoef, R., & Koskela, L. (2000). The four roles of supply chain management in construction. *European Journal of Purchasing & Supply Management,* 6(3), 169–178.

13. Project Management Institute. (2021). A Guide to the Project Management Body of Knowledge (PMBOK Guide) – Seventh Edition. PMI. [2021]

14. Hollmann, J. K. (2016). Project Risk Quantification: A Practitioner's Guide to Realistic Cost and Schedule Risk Management First Edition.

15. Flyvbjerg, B. (2009). Survival of the unfittest: Why the worst infrastructure gets built. *Oxford Review of Economic Policy,* 25(3), 344–367.

16. Ghanem M, Hamzeh F, Seppänen O, Shehab L and Zankoul E (2022) Pull planning versus push planning: Investigating impacts on crew performance from a location-based perspective. Front. Built Environ. 8:980023. DOI: https://doi.org/10.3389/fbuil.2022.980023

17. Ze Yu, Chuxin Wang, Yuanyuan Zhao, Zhiyuan Hu, Yuanjie Tang (2023). Linear Project-Scheduling Optimization Considering a Reverse Construction Scenario. Applied Sciences, 13(16), 9407.

18. Ballard, G., & Howell, G. (2003). Lean project management. *Building Research & Information,* 31(2), 119–133.

19. Sacks, R., et al. (2010). Interaction of Lean and Building Information Modeling in Construction. *Journal of Construction Engineering and Management,* 136(9), 968–980.

20. Martínez, S., & Liu, Y. (2021). Evaluating Lean Pull Planning and Traditional Push Scheduling in Large-Scale Retail Rollouts. *International Journal of Construction Management,* 21(7), 530–546.

21. Besklubova, Svetlana & Zhang, Xueqing. (2019). Improving Construction Productivity by Integrating the Lean Concept and the Clancey Heuristic Model. Sustainability. 11. 4535. DOI: https://doi.org/10.3390/su11174535

22. Fedyk, M. (2024). Strategic management in times of crisis: adaptive strategies for ensuring business resilience in post-war Ukraine. *Philosophy and Governance*, (3-4), 62–69. DOI: https://doi.org/10.70651/3041-248X/2024.3-4.08