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> How to ensure the successful uptake and implementation of AWP in brownfield EPC projects <

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Overview

The case study presented in this paper revolves around the digitalization of work packages (among the introduction of other digital tools for materials management and completions management) across 28 brownfield project sites in the North Sea. Low rates of digital adoption persist in brownfield construction projects where digital maturity lags behind benchmarked industries, so the introduction of digital work packages into these environments was novel. Digital work packages help to enable brownfield project delivery using Advanced Work Packaging (AWP) methodology, which is an increasingly sought after construction approach that strives for constraint-free project execution.

This paper highlights the mixed adoption rates of new software tools including digital work packages, the variability of which was a result of the degree to which change management techniques were implemented. Change management that ensures the successful onboarding, uptake and scalability of new digital tools such as work package software is more likely to take hold in digital partnership, so that the right training, resources, reinforcement and monitoring can be provided throughout the transition. A unified approach of software selection with change management guidance via digital consultancy will significantly improve the successful adoption of digital technology and improve the rate of returns in brownfield project delivery.

Humans v Tech: The true barrier to digitalization

Digitalization that combines technical with people-centric solutions are poised to save the energy sector trillions of dollars. Why, then, is the digitalization of onsite oil and gas project workflows largely stuck in the pipeline?

Research indicates that technology is not the barrier, instead pointing to cultural and organizational hurdles that interfere with the successful uptake and scalability of available digital technologies.

Digital transformation (DX) is replacing paper processes with digital tools and systems. The continued use of paper-based work packages in brownfield projects leads to extra costs, lost productivity, a lack of resiliency, inefficient communications, convoluted workflows and supply-chain management, as well as unsustainable practices.

Successfully adopting efficiency-enhancing tools and methodologies such as digital work packages and AWP, respectively, have been demonstrated to deliver the following benefits:

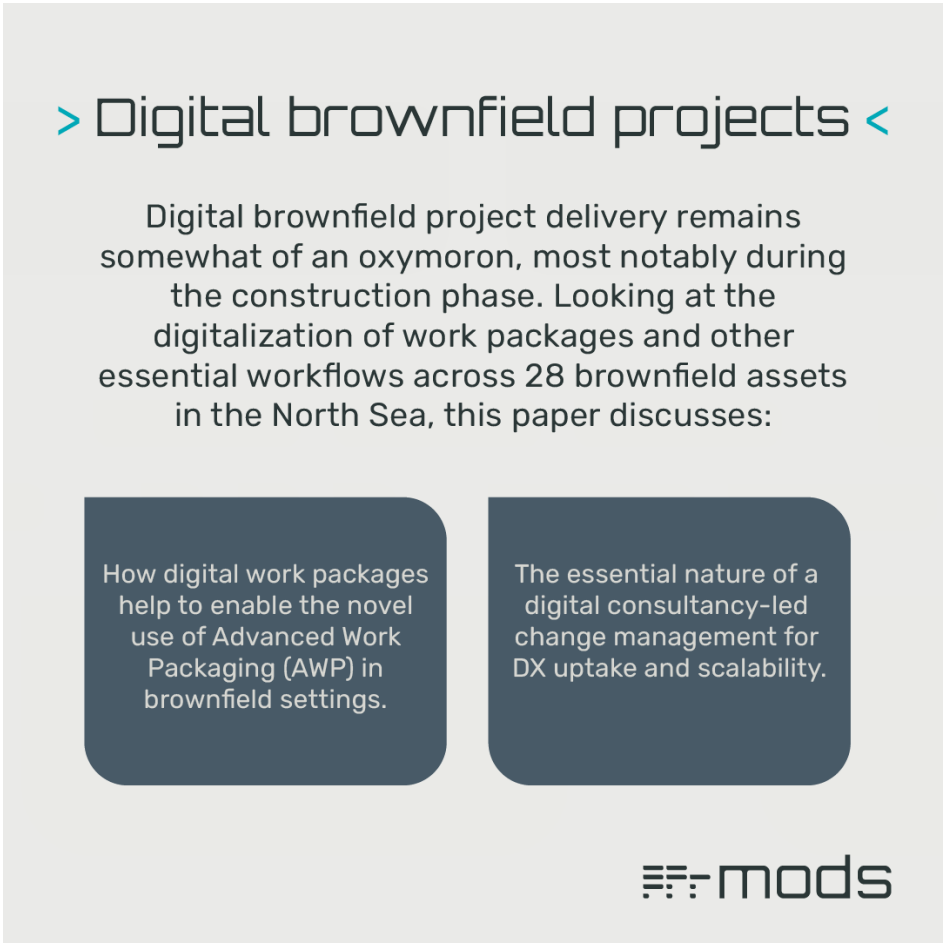
- Reduce time spent providing key project data to clients by 50 percent.
- Reduce offshore administrative time and ensure accuracy and control of paperless, workflow-based digital work packs.
- Shorten the closeout schedule.
- Deliver a high volume of wide-ranging brownfield modifications on schedule and within budget.
- Fast turnaround to replace critical pipework to ensure continuous operations.
- Eliminate a 7-to-14-day turnaround time for paper work packs to reach an offshore asset.

Successful DX demands alignment of people, processes and technology.

Brownfield construction execution is plagued by jerky starts and delays as contractors, operators and owners try to access, collate and understand fragmented information that is both archival and reflective of the current asset status. The case study herein reminds us of the following:

> "Even the most advanced technology can't achieve anything by itself. Value emerges as a combination of the tool and the people who operate it. Advanced solutions often fail not because they produce erroneous results but because the workforce doesn't understand, or trust, those results. That's why successful digital transformations take a people-first approach."

Yet there is a misguided tendency to focus more on the technological aspect over the human. As users of new digital tools, people need to change mindsets, develop new skills, embrace new processes and modify established working practices. If these things aren't in place, workers are unlikely to champion the change that comes with digital transformation, leading to low adoption rates and compromised return on investment. The desire for efficiency must subordinate the fear of change. This can be accomplished through a robust change management program ushered in through digital partnership.



What is Advanced Work Packaging (AWP) and how can it help brownfield projects?

The Construction Industry Institute defines AWP as:

> "[An] industry best practice that begins during early project planning and spans the entire project lifecycle. AWP aligns engineering, procurement, and construction to improve overall project performance by filling the gap between what design creates and what construction needs to execute work. Gain visibility into project details by supplementing design models with schedule resource, and construction related information."

AWP flips construction execution on its head and plans "end-to-start" to try and mitigate any constraints that may arise. AWP is effective, demands digital tools and is now considered an industry best practice for EPC construction projects. Though, to date, it's rarely applied in the brownfield space.

The brownfield digital challenge

Brownfield projects are notoriously challenging and pose additional barriers to successful efficiency-enhancing, AWP-supporting DX, including the adoption of cloud-based work packages. The unique challenges associated with Brownfield projects are summarized below:

- As developments of existing sites or properties with pre-existing structures, design flexibility is constrained.
- Project work has additional requirements and additional permits relative to greenfield.
- Brownfield sites are higher-risk environments that involve working around live plant.
- Often highly constrained in terms of construction personnel at site and material laydown.
- More planning detail is required due to higher constraints.
- Tools and systems are often limited & inherited from the CAPEX and OPEX phases. More difficult for Contractor to blend existing tools with their modern preferred suite.
- The potential for digital investment/funding is considered less attractive due to scale, and a smaller percent of budget would be allocated to this relative to greenfield projects.
- Data and information typically revolves around 2D CAD files as PDFs. As-built documentation is not always robust and it can be difficult to extract data and information.

Digitalizing workflows, especially the time-and-transport intensive ones such as work packages are a huge part of being able to successfully implement AWP project methodology because digital systems are essential to collect and organize data, as well as to reduce wait-time and optimize time on tools. Yet existing AWP solutions have not translated easily to the brownfield context because reliable case studies in this environment are rare (historically, AWP proofs have been for greenfield projects).

Software used to manage key workflows including work packages or materials management are accessible AWP tools in the brownfield space. The adoption of digital work packages as an AWP tool in a brownfield project setting can, in fact, accelerate digital transformation with consultancy-led change management for the best uptake and potential-to-scale outcomes.

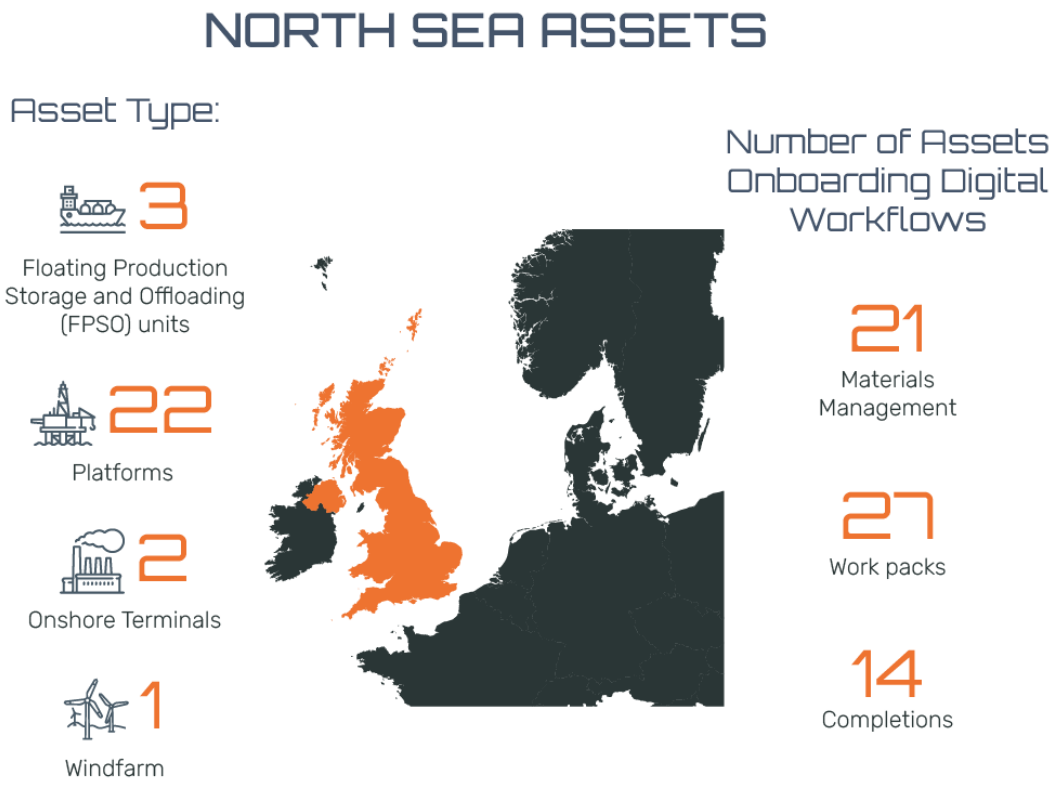
The low rates of digital-adoption in brownfield projects to date speaks to their inherent project complexity – they can feel more constrained to existing methods, systems and processes – and the challenges in aligning archival information with new. While the level of detail and precision in work packaging may differ to those of greenfield projects, applying AWP principles to the brownfield space, digitalizing project workflows and focusing on changing mindsets can help improve coordination, communication and overall project efficiency.

Adopting AWP software tools such as digital work packages may require additional effort and flexibility to adapt the digital tool(s) to the specific constraints and conditions of brownfield projects, which is why the human element is so critical. With the right digital consultancy in place alongside the onboarding of AWP-supporting tools such as digital work packages, the potential productivity and project performance benefits make the transition well worthwhile as demonstrated by the following portfolio case study.

A case study in digital partnership across 28 North Sea brownfield sites

This case study in digital partnership between MODS and between a Tier-One Contractor revolves around the introduction of new software to digitalize work package, materials management, completions and reporting workflows across 28 North Sea brownfield project sites. The idea was to assess the degree to which uptake was a success as impacted by the extent to which change management techniques were applied in support of the humans responsible for implementing and sustaining the DX.

MODS Connect WorkPack (and all MODS software) is technology agnostic, meaning that it can integrate with any legacy system. This enables accessibility of both archival and current information for all stakeholders throughout all project phases. Software of this nature that digitalizes primary workflows opens up the floodgates of value engineering and means that brownfield projects can be delivered in the same repeatable manner – both of which are to enormous benefit for the contractor.



The 28 North Sea brownfield assets under analysis

Following the introduction of the software, the 28 brownfield sites achieved varying levels of early-stages digital transformation. The following two examples illustrate the DX experience from either side of the spectrum to help identify change-management related reasons for success and/or failure and to recommend next steps.

Example 1: Without desire, change is impossible.

Upper-level management were initially receptive to the idea of DX and embraced, in principle, the onboarding of new digital solutions. Superficially, there was a broad awareness around the benefits of digitalization to improve brownfield construction efficiency. And the upper-level management had the desire to engage their team in a phased digital approach. But to progress the DX successfully, it's not enough for only the upper-level management to harbor the desire for change. Change must be desired throughout the organization – this is especially true for the project teams whose jobs are most impacted by the new tools.

Desire among middle management and engineering was the stumbling block to successfully going from 0 to 1 in this instance. These groups demonstrated far less willingness to change their current way of working relative to their upper-management counterparts.

When considering the digitalization value chain, the barriers to successful adoption are more likely to be downstream, closer to the hands-on the new software (or other tool). Middle management and engineering actively expressed a reticence to adopt new practices because they didn't want to change their daily ways of

working. Without their willingness to participate, the software tool won't be used either at all or to its fullest potential.

This reluctance to adopt new digital processes fed back to both the energy services company and EPC contractor, which had the opposite-to-intended effect, creating more inefficiencies as the overseeing entity had to pivot, modifying their preferred approach to suit. It became clear that the only way in which any digital system would be adopted by middle management and engineering would be to replicate the current paper system(s), which would obliterate the benefits of going digital in the first place.

Pushback to adopting the new digital solution also came from the client Document Control Department (DCC) who, similar to middle management, didn't have the desire to change their current way of working. The resounding lack of desire (save for upper-management) resulted in poor uptake of the new software. Interestingly, the only element of the software that was used in part were the digital job cards (part of MODS Connect WorkPack), which, even still, were unnecessarily printed off, filed away in binders and manually referenced in the manifesting and shipping of goods. Clearly, the digitalization was not taken advantage of and, as such, failed.

To cultivate a desire to change, a dual top-down and bottom-up approach is best. In this instance, upper management were enthusiastic, but this didn't permeate middle management. Cultivating desire for digitalization throughout an organization needs to be an intentional process convincing people that the change will make their jobs easier and improve performance. Middle management downstream through to the end users are those who will become ambassadors for uptake of a new working system. Their buy-in is most critical. Involving middle management in the DX decision-making process as to which software solution best solves their site-based workflow problems would have helped, and this is where a more robust digital consultancy could have intervened to generate excitement with education and training. Agency and choice contribute to cultivating a desire to change.

A digital consultant-led change management would have mitigated this outcome. Moving forward, the recommended next steps for a stalled DX, include:

- Raise awareness by redefining roles and responsibilities. Communicate this through in-person meetings, emails and distribution of materials.
- Make it clear that the change is happening.
- When there's a complete level of awareness about the impending DX, then advance to actively cultivating desire.
- Generate desire and continually circle back to ensuring awareness of the DX throughout the organization. Create an evidence-base for the benefits. Clarify the benefits of the proposed solution.
- Once both awareness and desire exist throughout the organization, the users are ready for technical training to develop knowledge in using the new system.

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Example 2: With properly managed change, DX accelerates towards heightened efficiencies

As with the first example above, upper management were enthusiastic from the get-go. The difference here was that a greater level of control was granted to middle management, who were brought in early. This helped generate upstream awareness and desire, which created a foundation of trust (and, importantly, a willingness to adapt) on which to manage change.

Because middle management were actively included and therefore had agency in the DX process, they requested training sessions to which upper management responded supportively. Communication between the organizational levels was positive, there was mutual transparency, trust and encouragement in the process. This all contributed to a very necessary desire for the digital uptake across the organization.

This resounding desire led to requests and offerings for training to upskill the workforce to the new ways of working, resulting in the successful uptake of digital work package software as well as the digitalization of other key brownfield workflows. User feedback was taken seriously and acted upon, leading to customized improvements in the software by the developer – something that can only happen when working in digital partnership.

The asset owner understood from the get-go that the adoption process would require patience and activation energy to overcome the initial stresses associated with initiating any workflow changes. But because the desire was there, the client was prepared to invest in the totality of the solution, optimizing the return on investment. This included displaying a willingness to forge a digital path and investing in a medium-term digital partnership that included onsite vendor support. This digital partnership included helping to integrate the new tools with their existing systems.

Continued digital consultancy would recommend the following next steps to ensure continued DX success towards scalability:

- Implement onsite vendor support, as and when requested by users.
- When any customization changes to the software are made, revert back to building awareness so that all necessary parties can anticipate and implement any tweaks to the system.
- Continue to cultivate desire for even more efficiencies so that the DX can continue to grow, expanding beyond a single project, a single asset, into portfolios and even enterprise-wide change.

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Digital consultancy alongside the onboarding of new software tools for lasting DX cultural transformation

A staggering 70 percent of change initiatives fail because of seemingly obvious requirements including a lack of management support, a lack of clearly defined and achievable objectives and poor communication. In the absence of desire for change throughout an organization, the motivation to hurdle the activation energy needed to learn new skills doesn't exist. Active change management alongside digital consultancy can help by prioritizing people who are ultimately responsible for the uptake and upscaling of digital solutions. The potent combination of the right digital tools alongside an intentional change management strategy helps accelerate adoption by both office and site personnel, ensuring scalability for successful digital AWP brownfield project execution.

Readying for and implementing digital transformation with an experienced digital partner means that user feedback can be actioned not just on a personnel level, but from a software-development standpoint as well.

> "Focus equally on adoption and development. User adoption starts with developing great technology solutions that offer an excellent customer experience. But companies often underestimate all the additional elements of the business model that need to be changed to secure adoption…That end-to-end system approach, with a focus on the people side of the equation, is what differentiates digital leaders. They achieve this by making the business accountable for the end-to-end transformation of the domain. As a rule, for every $1 spent on developing digital and AI solutions, plan to spend at least another $1 to ensure full user adoption and scaling across the enterprise."

The paper-to-digital transition is never easy, particularly when brownfield projects teams are tasked with wrapping their heads around the heady mix of AWP methodology and the learning curve inherent to new software tools. The inescapable truth is that technological tools such as industrial software solutions designed to capture efficiencies throughout construction projects are important, but it is the users who are the most important element to successful uptake and eventual scalability of the technology. The users determine whether or not available technologies are onboarded successfully and, if so, only then can at-scale benefits be realized. Digital consultancy is the vehicle that can guide organizations through this in the most streamlined manner possible. After all, digitalization and AWP are all about realizing efficiencies.