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Tailored ICT strategies:

Smart solutions for industrial cities

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Introduction

Over the last decade "smart cities" is a term that has been frequently heard in public discourse. The goal of "smart cities" is to deliver a better experience to inhabitants of a city and make the city management easier. This improved experience may be achieved through omnipresent connectivity, enhanced mobility, efficient digital interactions with authorities, and improved safety and security. As smart cities increase traction, the idea of making something "smart" has spilled over to other complex ecosystems. One of those is Industrial cities.

The primary inhabitants of industrial cities are industrial companies and other stakeholders in the industrial value chains, not necessarily individual citizens. However different, industrial companies, too, want a "better experience." To accomplish this, there is an increased interest in incorporating advanced technologies and digital intelligence.

But what is considered a "better experience" by an industrial company? Thinking in categories of value creation, industrial companies are always searching for new levers to unlock value – whether through optimizing costs and / or increasing revenues. According to Deloitte research, the right combination of digital transformation activities can unlock as much as ~US1.3$ trillion in additional market capitalization across all Fortune 500 companies. The wrong combinations can erode market value, putting more than ~US1.5$ trillion at risk[1]. Becoming smart requires more than intent and significant investment.

This is where the concept of a smart industrial city differs fundamentally from that of a typical smart city. Transforming a regular city into a smart one involves creating a digital ecosystem that citizens can connect to. In contrast, making an industrial city smart requires the individual modernization of each industrial company. This collaborative effort among companies fosters an integrated ecosystem. No two industrial companies within the same industry are identical. Factors like their position in the value chain, company size, portfolio offerings, capabilities, and organizational structure contribute to each company's uniqueness. Consequently, each industrial company necessitates distinct technologies and solutions for its smart transformation. Therefore, developing a smart industrial city entails embracing, not avoiding, this diversity.

Large industrial companies often have the capability to develop smart technologies internally, yet many still need external collaboration. However, not every Information and Communication Technologies (ICT) provider is equipped to meet the demands of such partnerships. A typical approach for ICT providers is to wait for an industrial client to specify their needs through a detailed RFP (Request for Proposal). A more proactive strategy might involve creating standardized solutions for frequent ICT requirements, like cloud migration or communication services. Yet, these methods often result in limited growth for industrial clients, commoditization of the ICT market, and untapped potential for ICT firms. ICT providers should consider customizing their services to focus on specific outcomes for each industrial client.

However, creating bespoke solutions for every client is neither inexpensive nor swift, and is challenging to achieve from an outside perspective. The complexity multiplies when the client is an entire industrial city. But this complexity is the very reason why industrial clients value ICT providers' support and expertise. It means that developing an approach to cut through this complexity is crucial for ICT providers' success in making industrial clients smart.

While ICT providers might not possess in-depth insider knowledge of a specific client, understanding the client's industry serves as an effective starting point for customizing their services. To build on that starting point, Deloitte has developed a framework providing the guidelines to develop an integrated ICT value proposition, tailored to a potential industry client. This approach can be utilized by any industrial entity too, ranging from a small company to an entire industrial city, to assess their digital capabilities and determine how well they align with their strategic goals.

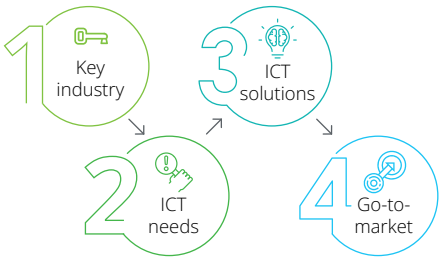
Transforming a regular city into a smart one involves creating a digital ecosystem that citizens can connect to. In contrast, making an industrial city smart requires the individual modernization of each industrial company.

[1]Source: Deloitte report "Unleashing value from digital transformation: Paths and pitfalls", 14 February 2023

The approach

Our framework covers 4 critical steps to establish such a fit-for-purpose industrial ICT offering, with each step adding value:

1. Key industry
2. ICT needs
3. ICT solutions
4. Go-to-market



Step 1. Key industry

Whether considering a single industrial company or an industrial cluster, defining the key industry is essential. For a single company, this may be straightforward, but the task becomes more complex for industrial conglomerates or clusters, especially as some operate across multiple industries.

Typically, focusing on a single site within these conglomerates or clusters can simplify the identification of the key industry. This is logical, because industrial digitization and smart industrial solutions are generally location-specific. Their primary focus is on automating production processes, which tend to be specific to each site.

In cases where a single site encompasses several industries, it becomes necessary to prioritize them. This prioritization can be based on metrics like revenue or profit, with the industry generating the highest revenue or profit designated as the key industry.

After identifying the key industry, an ICT provider should assess the size of the clients — categorizing them as small, medium, or large enterprises. The scale of the enterprise significantly influences its ICT needs for integrating smart features, as well as its budgetary constraints and capabilities. Generally, larger enterprises possess more robust internal ICT capabilities. Conversely, small and medium enterprises may face challenges in fully realizing the potential of smart transformation due to the inefficiencies associated with a smaller scale.

Key takeaway: Start with defining a key industry and mind the size of your industrial client.

Step 2. ICT needs

Identifying the industry is a crucial starting point, yet it often comes with considerable uncertainty. Take the mining industry as an example; it encompasses a diverse array of enterprises such as component manufacturers, mine operators, refiners, and smelters, all identifying as players in the mining sector. For an ICT provider, -it is essential to understand the specific segment of the value chain in which a potential client operates.

The industrial value chain encompasses the series of steps involved in creating a product or service. This process could span from the procurement of raw materials or equipment to the delivery of goods to the customer, including customer support. At each step in the value chain, such as sourcing, manufacturing, and marketing, value is added to the product or service. Value chain analysis can be conducted at various levels of detail, and it is crucial to find the level that is most relevant to the analysis. A deeper exploration of the value chain can uncover additional insights and opportunities, although this is not always the case.

Value chain analysis helps in aligning clients with specific industrial activities or processes. The digitization needs of a client will differ based on the nature of their activities in the value chain.

Exhibit 1. Simplified industry value chain example for the mining industry

When there is an understanding of key activities in which an industrial client is involved, the ICT provider can identify digitization needs that align with these activities — steps that will advance industry operations towards "smart" ambitions. Here, we should think about catering to the current operational requirements but also anticipating future technological advancements and industry trends. Additionally, the focus should be on paving the way for integration within the industrial ecosystem. What could be automated? Can we make some of the processes more efficient using modern technologies? These are some of the most obvious questions, which ICT providers can use to advance through this step.

After drilling down from industry and industry value chain to industrial processes and corresponding digitization needs, we can start developing tailored ICT solutions that address those specific needs.

Key takeaway: Use value chain analysis for the key industry to identify activities and uncover ICT needs matching said activities.

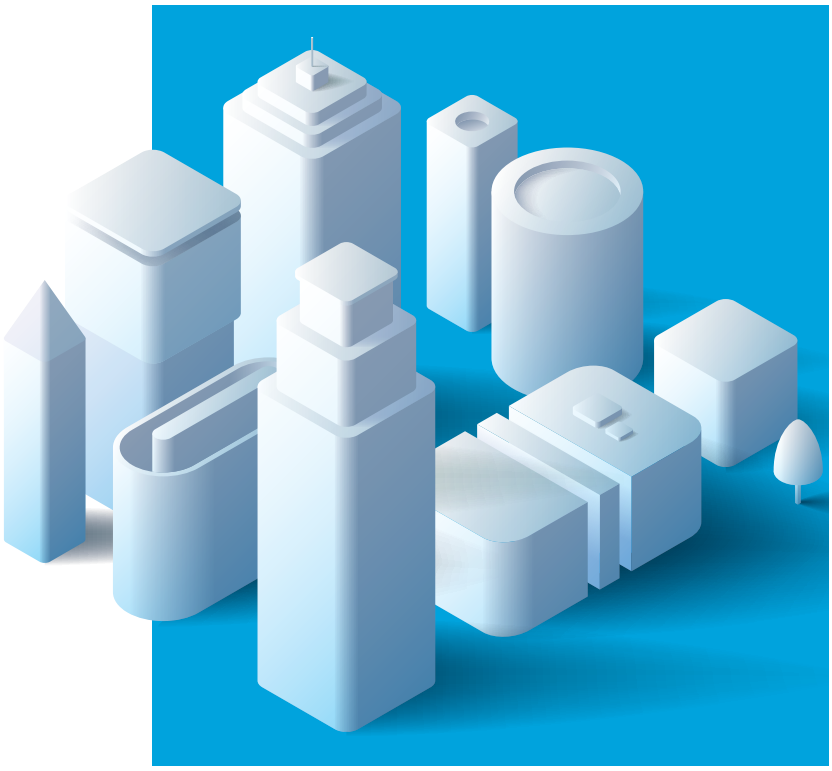


Exhibit 2. Illustrative example of mapping ICT needs to value chain steps

Value chain steps	1 Reconnaissance	2 Exploration	3 Exploitation & growth
ICT needs	Remote sensing and imaging solutions	Exploration modelling and simulation	Operational systems (SCADA)
	AI-enabled aerial data analysis	Geological modelling	Real-time monitoring and analytics systems
	Advanced geospatial analysis	Automated drill data analysis	Asset management systems
		Predictive Ore body identification	Automated career trucks
			Lot solutions for personnel safety tracking
	Network capacity, speed and latency		
	Cloud / "on premise" compute capacity		

Step 3. ICT solutions

After we have identified ICT needs of an industrial client, we can select ICT solutions to satisfy these ICT needs. This means searching for digital or technological solutions which help businesses to operate more efficiently across relevant industrial activities, streamline these activities, and ultimately increase the bottom line of the client.

Leveraging a framework is beneficial because one does not fall prey to bias of prejudice and past experiences, but genuinely covers the span of available opportunities.

In Deloitte we typically use our map of six ICT domains and sub-domains here. These domains are IT & Network Infrastructure, Telecom Services, IT Infrastructure Services, Cyber Security Services, Digital Solutions, and Digital Transformation.

There are several types of products and services in each domain/sub-domain – several possible ICT solutions. Using industry and ICT expertise we check them one-by-one to select those which match certain industrial ICT needs.

Every selected ICT solution will have distinct delivery requirements which the ICT provider must understand and test for each client situation. There is no one-size-fits-all approach to deploying ICT solutions. Each solution demands a tailored delivery strategy that considers its unique aspects, such as its technical specifications, hardware and software compatibility, user training needs, support and maintenance prerequisites, security protocols, integration with existing systems and more. For effective implementation, it's crucial to understand and plan for these individual requirements. Failing to do so could lead to challenges in deployment, suboptimal performance, or compatibility issues.

The ICT provider should leverage past experiences with these or similar clients as well as industrial best practices to understand strong and weak points of their ICT offering. The strength of the whole ICT value proposition of the ICT provider may be judged based on the strength of its weakest part.

The most straightforward approach for an ICT provider is to build their offering around their strengths, while excluding solutions where their capabilities are weaker. However, our experience shows that ICT provider companies rarely provide a winning end-to-end offering independently; they typically form consortia to achieve this. Therefore, the importance of finding a partner with complementary strengths and the right capabilities to establish a sustainable partnership is crucial and should not be underestimated.

The success of forming these partnerships hinges on conducting comprehensive market analysis and carefully choosing partners based on their capabilities and cultural fit. This strategic selection ensures that the consortium addresses every aspect of the end-to-end offering, bridging any capability gaps and fostering a more robust and competitive solution.

Key takeaway : Link ICT needs to ICT solutions, while proactively addressing your weak and strong areas within this offering.

Exhibit 3. Illustrative example of matching ICT solutions to ICT needs

ICT domains	IT & network infrastructure		Telecom services	IT infra services	CyberSec services	Digital solutions	Digital transformation	
ICT sub-domains	IT & network equipment	IoT and end-user devices	Network services	IT infrastructure services	Cyber Security services	Platforms & application development	IT & network consulting services	IT & network products resell
Select examples of ICT solutions	Mobile networks equipment	Sensors, aggregators & transponders				Middleware / SOA		
	Fixed network equipment	Gadget & appliances						
	Networking equipment	SIM cards & CPEs	Telecom infastructure sharing					
	Storage	Other end-user devices				Unified communications		
	Servers							

Step 4. Go-to-market

We are now transitioning from identifying ICT solutions to prioritizing them, considering both business outcomes and operational complexities. Utilizing a simple two-by-two matrix with axes labeled 'Ease of implementation' and 'Strategic relevance' provides a framework to evaluate the proposed ICT solutions portfolio from the perspectives of a client's CEO or CFO.

Which ICT solutions will create the most value? Which of the solutions will be the easiest to implement, so the associated value will be accrued the fastest?

It's crucial for both clients and ICT providers to align their commercial interests. The ICT provider's goals must synchronize with the long-term commercial objectives of the industrial client. Clients will value an ICT provider that invests time and resources in structuring a value proposition that effectively highlights the most impactful solutions. This approach should clearly differentiate between 'quick wins' and opportunities that offer a longer payback period, demonstrating a comprehensive understanding of the client's needs.

The success of the smart transformation heavily relies on an effective go-to-market plan. This strategy includes crafting a compelling value proposition and a detailed offering, determining the most suitable delivery model for each component of the ICT offering, and choosing a pricing model that is mutually beneficial and competitive in the market.

An unrealistic delivery model or suboptimal incentive scheme might lead to friction between the ICT provider and industrial client, will hinder the implementation of an ICT solution and lead to value left on the table for both parties.

The chosen delivery model depends on whether the ICT provider is well equipped to deliver the service with their own resources and capabilities, or will require a partner, and who the partner (or partners) might be.

Pricing strategies can range from straightforward models like cost-plus to value-based pricing. Cost-plus is most effective for mature IT and Network equipment where the average cost-to-serve is fully transparent. On the other end of the spectrum lies value-based pricing. This approach hinges on the extent to which your product differentiates from the next best alternative, if clients clearly recognize this degree of differentiation.

Key takeaway: Tailor your ICT offering for value maximization and support it with matching go-to-market elements.

Exhibit 4. Prioritization framework

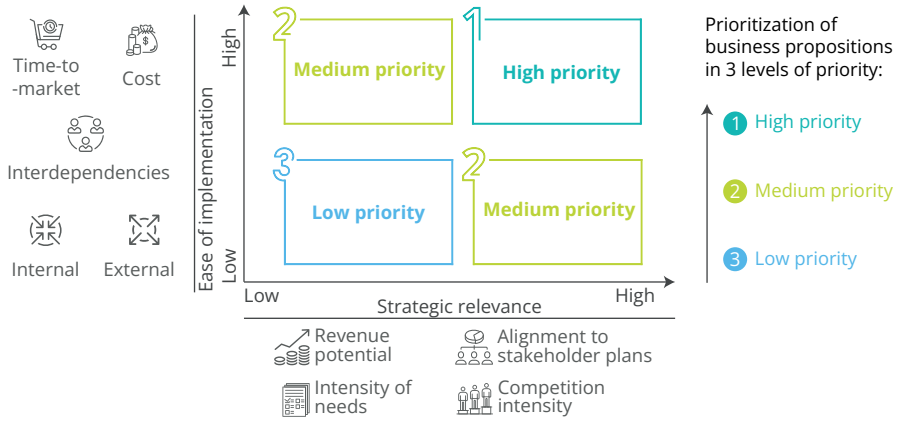
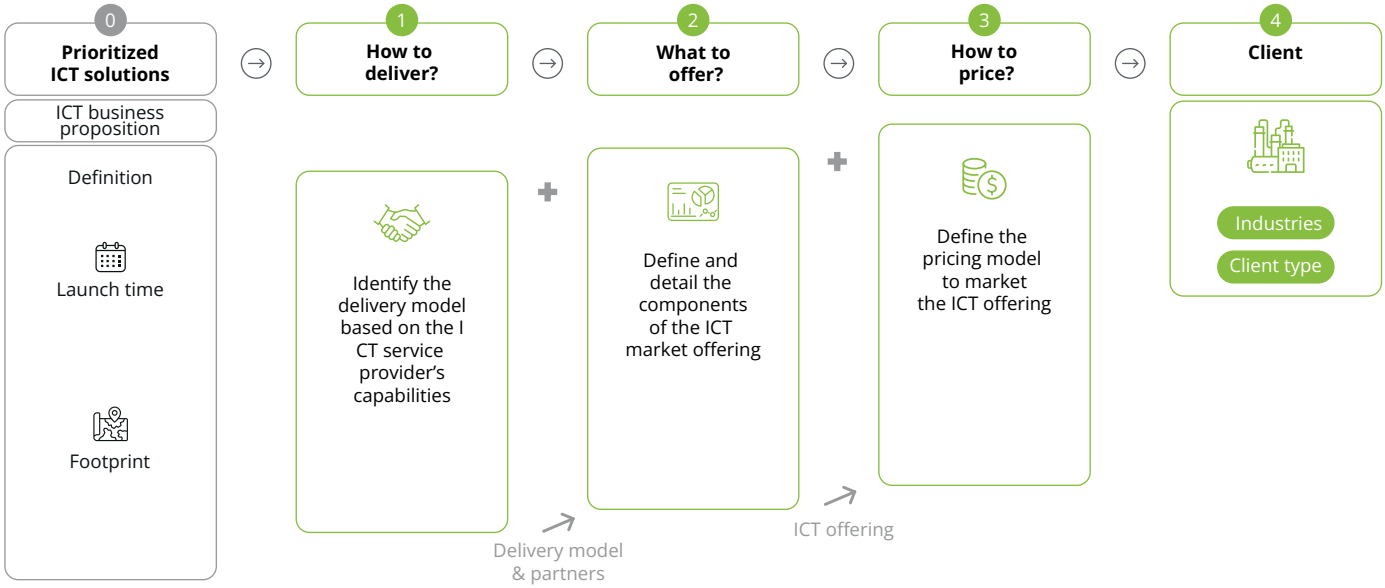


Exhibit 5. Steps of GTM planning



Application of the approach to Industrial cities

With the rising competition between the world leading economies and emerging countries' ambitions to move forward, industrial cities are witnessing increasing interest in the GCC due to their significant impact supporting the overall economies of the countries they reside in.

In a typical city, the business operation landscape primarily encompasses three client segments: Business to Business (B2B), Business to Consumer (B2C), and Business to Government (B2G). While ordinary cities usually feature a balanced mix of these segments across various industries, industrial cities are characterized by a predominant emphasis on the B2B segment.

Industrial cities are a specific type of industrial hub, often spanning large areas, up to a hundred square kilometers. These cities are primarily designed to accommodate industrial processes, with their residential components usually being secondary or even non-existent, often relying on neighboring traditional cities for housing. Industrial cities are strategically located at transportation crossroads, combining multiple modes of transportation such as ports, highways, airports, and railroads. Some of the world's largest industrial cities occupy hundreds of square kilometers and sit at the heart of major logistics networks.

One example is the Map Ta Phut Industrial Estate in Thailand, which is one of the largest petrochemical and heavy industrial hubs in Southeast Asia. This industrial city encompasses a vast area dedicated to refineries, chemical plants, and other industrial facilities, and relies on nearby towns for residential and civic amenities.

Another example is Pohang in South Korea, which is heavily dominated by the steel industry. The city is the site of POSCO, one of the world's largest steelmakers. Pohang was developed primarily to support this vast industrial complex, with much of the city's infrastructure and economy centered around the steel industry. While it does have residential areas, the city's primary function is as an industrial hub, with a sizable portion of its urban landscape dedicated to steel production facilities.

Industrial cities display diverse characteristics, shaped by the key industries operating within them. These industries define the core purpose and objectives of the cities. Most industrial cities focus on a single key industry. Others have primary and secondary industrial focuses. For instance, Khed City in India concentrates on both the automotive and healthcare industries, with a greater emphasis on automotive.

To maximize value from the smart component of any city—typical or industrial—it is essential to integrate technology across interconnected business segments within the city. In case of industrial cities, B2G and B2C segments are usually negligible, so it may look as a more straightforward environment for an ICT provider. However, it is quite the opposite. The expectation for an industrial city ICT partner is not to provide technology layers, but to enable growth, which means unlocking profits for resident companies. This requires customizing both ICT solutions and Pricing/Delivery models to meet the specific ICT needs of the key industries within these cities with an emphasis on generating value.

We can see how an industrial city is the ultimate industrial client. Industry-focused, hosting several companies across the value chain of that industry, functioning according to certain rules and regulations—this is a multi-layered, multi-stakeholder environment. Adding "smart" to an existing industrial city requires aligning the goals of residents of industrial cities, operator of the city and countries that host the city, and the ICT component is enabled and implemented in a structured and strategic way.

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Case study | Developing an ICT business proposition for industrial cities

The context

An ICT service provider based in Saudi Arabia has been tasked with handling and providing a range of ICT services in Smart Industrial Cities. To achieve this, the company has decided to formulate a new business strategy and develop a unique ICT business proposition that will cater to the specific needs of its potential customers. The primary objective is to ensure that the different ICT requirements of the potential customers within the cities are addressed and provided in a timely and efficient manner.

The challenge:

- How to identify the strategic aspirations to be achieved by the client? And what initiatives will be needed to achieve these aspirations?
- How to identify the potential customers that need to be served by the ICT service provider?
- How to understand what services and offerings are needed to be provided to the identified customers?
- How to prioritize which services should be offered first to the potential customers?
- How to design the required enabling capabilities that will prepare the client to address its customers' needs?
- How to develop the activation plan that will deliver the client's designed value proposition?

The solution:

Deloitte has mobilized its pool of professionals and subject matter experts to meet the client's needs and challenges. We have followed the approach, described in the previous section of the whitepaper, to develop the client's strategy while identifying the client's value position along with its go-to-market strategy, through the following:

1. Assess the existing capabilities of the client and understand the market dynamics from customers' preferences to competitive analysis and existing ICT trends.
2. Identify the client's strategic direction (vision, mission, and strategic objectives) and develop the strategic initiatives to achieve these objectives along with their corresponding KPIs.
3. Identify the targeted cities and their operating models, then conducted the value chain mapping to understand the customers' specifics and prioritized ICT needs.
4. Supported with a library of ICT solutions, use-cases and external view on capabilities of existing ICT providers, we built a comprehensive value proposition that will address the specific ICT needs of potential industrial customers.
5. On the final stage of the project, we developed delivery models, identified the right delivery partners, detailed the components of ICT market offering, and worked on the pricing models to align interests of the ICT provider and Industrial Cities.

Conclusion

Crafting complex ICT offerings with limited insider knowledge is challenging, but achievable, using public data and an outside-in approach. While it involves navigating through several crucial stages, the outcome can lay a solid foundation for a mutually beneficial technological and business partnership between an industrial company and an ICT provider.

Our method at Deloitte is backed by extensive experience in assisting both ICT and industrial clients. This approach encompasses essential steps to develop a comprehensive ICT offering, suitable for clients of any scale, including industrial cities.

Our framework is designed to produce successful offerings for any client, providing a structured pathway to ensure that the final proposal not only meets but surpasses the client's expectations by focusing on long-term value creation.

Whether it's an industrial city or a leading industrial conglomerate, there are significant opportunities to harness technologies like GenAI, Machine Learning, and 5G for smart industry applications. Technological advancements enable manufacturers to address their challenges, align with the interests of host nations, and maintain their vital role in the global economy. ICT providers play a crucial part in empowering them to achieve this ambitious objective.

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