Twenty5 Release Notes

Last Updated October 2024

Version 2.4 - October 2024

Our last major update before we move to a new AI-power tool named after a type of Eagle (version Aquila) coming out later in 2025, includes the following enhancements:

Navigation Improvements

Continuing the journey which we started in versions 2.2 and 2.3, we have provided a number of additional options to aid users in navigating between proposals and estimates, as well as further developing the single app proposal/estimate concept for simpler or smaller projects. Users can now navigate or open an estimate directly from the proposal search screen ("Estimates" column), from the phases tab, and from the contract lines tab, in addition to our existing options to navigate to the estimate from the WBS tab and from the more toolbar button 'Open' menu. Open menu navigation is now full-circle, meaning that users can navigate from proposal to estimate to cost/price analysis tool, in all directions, from the same menu.

Other Cosmetic Improvements

Other cosmetic improvements include:

- An improved empty table message
- Extending the ability to lock specific table columns from scrolling
- Additional sub-totals, for example in the phases/sets tab
- Improved rich text editor
- Real-time or 'push' notifications for costs requiring update or roll-up and for reports such as the cost/price analysis pivot when costs are not yet up to date.

More cosmetic and styling improvements including the option for client-specific color themes to complement our existing option to display the client's logo in our application, are coming.

Microsoft Dynamics CRM Extension

Most proposals especially in service-based industries start with an opportunity in our client's CRM, the vast majority of whom use Salesforce or MS-Dynamics. So it is natural for Twenty5 to build an extension to these CRM applications with full end to end integration to iPE, allowing clients to seamlessly (automatically based on stage, or on user demand) convert CRM opportunities into proposals in iPE, create and price product-based quotation lines in their CRM tool, based on resource plans and costs directly imported from iPE, and

sync up data between CRM and iPE such as products sold, customers, proposals, opportunities and proposal or project cost and revenue breakdowns. We are currently in the process of certifying this extension app with Microsoft.

Clients have the option to install our CRM extension directly within their MS-Dynamics environment, providing additional tabs and screens for proposal cost and pricing data, replacing the need for a bolt-on or custom developed 'CPQ' (configure, price & quotation) CRM extension. Alternatively, clients can retain their existing CRM in-house developed extensions or purchased bolt-ons, and use Twenty5's CRM integration to connect their existing tools to iPE.

Salesforce CRM Extension

In parallel to building an extension for MS-Dynamics, Twenty5 has built a similar extension to Salesforce, which is used by a large majority of our clients. Built directly in Salesforce's Lightning platform, our extension offers future-proof, commercially supported off-the-shelf software to enrich the opportunity proposal development process and facilitate communication between sales and program delivery or client engagement managers preparing project-based proposals in iPE. Like our clients using MS-Dynamics, our Salesforce CRM clients have the option to adopt our extension in place of in-house developed or third party CPQ tools, or to integrate iPE with their existing Salesforce extensions. Either way and with either CRM application, Twenty5 commits to supporting and upgrading our CRM extension and integration technologies with every future release of MS-Dynamics or Salesforce, allowing our clients to upgrade or even switch with lower cost and risk.

Proposal Versions in CRM and SAP

Creating proposal versions provides a simple way to perform what-if analysis, compare scenarios and revert to a prior version if a change is subsequently rejected by the client or prospect. New proposal versions can create integration issues with SAP, if one version is sent to SAP, and then a new version is made active sent to SAP in update mode. It's hard to do this across versions without deleting and re-creating all the resources in the SAP project, which might not be desirable for a number of reasons. Fortunately, new versions are typically created as back-ups, with the original remaining as the primary edited version, especially prior to winning the contract and sending the resources to SAP for staffing. For this reason, we have provided additional checks when integrating proposals or projects between CRM, iPE and SAP that prevents back-tracking to prior versions which are different to versions previously sent to SAP at or close to contract award.

Opportunity Link to Proposal

Opportunities can be set up as proposal-specific - meaning that the same opportunity cannot be assigned to more than one proposal - or as shared, based on the proposal type configuration.

Customer Currency

The customer currency, previously available from the Edit Rates popup of the proposal Set-up tab, has been replicated to the Set-up tab itself based on client request. Other clients can still hide this, or any other, fields via our screen control set concept.

Customer and Supplier Codes

Customers and suppliers in iPE have a code or number assigned, numbers which are normally imported from SAP (suppliers) and/or CRM (customers). While these codes are visible in iPE, we have extended the visibility of the customer and supplier codes in iPE to more places such as additional table columns in the material cost estimating tab, as well as display of customer number in the proposal Set-up tab.

SAP Project and WBS Mapping Enhancements

As well as our interface for iPE to generate the SAP project and WBS hierarchy automatically in SAP, we have enhanced our SAP project/WBS mapping for when a certain level of the WBS is created manually or directly in SAP, including:

- Option to lock down or allow editing of the SAP project and WBS, by proposal type
- Option to link the SAP project to the proposal header (one SAP project for the whole iPE proposal) or to the proposal WBS (multiple SAP projects from one iPE proposal)
- Out of the box support for SAP project and WBS views in both SAP S/4 public and private cloud.

Contract Line Quantities per Month

Our contract line delivery schedules, whereby users can specify how many deliveries are made, and when, over any time periods, including support for delivery and pricing of subscription items or leases, has been further enhanced with a 'quantity per month' column in the contract line tab. We also now provide a pivot-style display and edit of quantities by month across all contract lines at once, with columns for each year and month.

We have also extended our Excel upload of contract lines to allow direct upload of different quantities per month - with columns for each month over the duration of the project - as well as automated creation of WBS elements and even phases or sets from the contract line Excel upload sheet.

Pricing Formula Expressions

Our pricing formula enhancement in version 2.3 - which allowed prices to be calculated based on outcomes such as 'business benefits realized' or 'power by the hour' (usage based) maintenance and support fees – has been further extended with the following features:

- Ability to define an expression for any price element. A pricing element could be based on, for example, cost, T&M revenue or on the equivalent T&M revenue at standard company rates. Expressions use MVEL - a powerful rules-based scripting tool – to fully support complex pricing scenarios. T&M revenues at company standard bill rates is also explained further below under Labor Bill Rate Enhancements

- Segregation of pricing formula quantity and percentage inputs from money ($) inputs. Instead of maintaining all these inputs in the same column, there are now separate columns for input of monetary amounts, percentages or rates and quantity inputs such as number of flights or usage hours for a maintained asset priced by usage
- Pricing elements which automatically aggregate the risk reserve or sum of weighted risks and opportunities, as well as pricing elements which sum up the cost of money based on pre-defined interest rates
- Cosmetic improvements to the layout of pricing elements such as highlighting or hiding specific rows and adjusting the order in which price elements are output to a PDF.

Labor Planning Enhancements

Enhancements to our labor planning - which as a reminder supports role-based planning by work-package, task or milestone, resource group, grade/seniority or skills and based on flat-line, curved or manually distributed hours, days or full-time equivalents by week or month – were made in version 2.4 to support daily, weekly, monthly or even yearly cost and billing rates. These rates are automatically converted to their equivalent hourly rate using each resource group's work-schedule or working hours by day, week or month.

We have also fixed the configuration of decimals used in resource labor planning, allowing our clients to specify how many decimals they want to plan units of hours, days or full-time equivalents in.

Finally, we have improved the column locking and sub-total displays in our labor tab, and you have an option to hide obsolete resource groups from being displayed without deleting them. This way, they are still visible on existing projects but cannot be selected on new projects.

Staffing Tool (such as ProFinda) Integration

Twenty5 and ProFinda are the two main third-party vendors certified by SAP as part of their industry cloud for professional services industries. Up until the current version all integration between Twenty5 and ProFinda was via SAP S/4 project and resource management, with roles created in SAP S/4 from the proposal in Twenty5's iPE tool, which were then downloaded and imported into ProFinda for skills matching, booking and staffing and then returned to SAP S/4.

This integration has been significantly improved in this release with a direct integration between Twenty5 iPE and ProFinda (or other) staffing tools which provides additional support for weekly resource planning schedules in iPE and ProFinda. Weekly planning is something SAP S/4 does not do, due to current limitations. iPE / ProFinda integration also supports skills and certification requirements by role in iPE which are then picked up and used by ProFinda for skills matching against available resources. There is also a quick-availability check feature in iPE, which simulates the role in ProFinda to see how many people might be available, prior to confirming and sending the role to SAP S/4 and then onto ProFinda (with weekly hours and skills coming directly from iPE) for staffing.

We have built a staff availability viewing panel in iPE, where estimators and engagement managers can see the provisional staffing situation from ProFinda - i.e. who is available and how good a match - directly within the iPE labor staffing screen. This allows estimators not only to check on resource availability which often impacts the cost of a role, but also to update the resource plan in iPE directly based on available resources from ProFinda. This might include delaying or shortening a role, or splitting a role from one full-time person

into multiple part-time (and available) named resources. Tracking of named resources in iPE, updated from ProFinda based on who is booked to a role, is also available.

Labor Billing Rate Enhancements

Twenty5's advanced price book (rate card) and bill rate determination built in version 2.2 - extended in version 2.3 to allow multiple price-books by service offering on each contract line within a single proposal - has been further extended to support:

- Billing rates which can be determined based not just on the resource group (seniority, role, or job classification of the role or resource) but now also based on 'customer role'. The customer role is like a contract-specific set of resource codes or groupings, to suit the needs of the end customer. While cost rates still depend on the resource group, grade and optionally the named resource and/or supplier, the billing rate can now depend on the customer role in addition to the price book, resource group, named resource and/or customer
- Advanced search capabilities have been added for both the resource group - based on location/department, skill/seniority or grade, cost center etc. - and the customer role, based on any number of attributes or custom tags assigned to classify and search for customer roles and their associated billing rates. The ability to filter resource group selections by grade is also new in this release
- Automatic determination of billing rate price book based on end item product line, customer/customer grouping, and organizational attributes, with the option to further edit the price book not just at the contract line but on each labor resource or role
- The concept of a company standard bill rate, in order to automatically calculate the equivalent T&M revenue at company standard rates and thus the associated realization factor or the actual T&M revenue compared to the T&M revenue at company rates. Company standard bill rates use a separate price book and can be based on resource group even while client MSA bill rates might be by customer role. Company standard bill rates are automatically set and rolled-up the WBS hierarchy to contract lines in your proposal, so that pricing strategies can be configured based on (or simply to display) a combination of cost, T&M revenue rolled-up and now also equivalent T&M revenue at company standard bill rates, all rolled-up based on WBS assignments to contract lines.

Product or Service (Master Data) Clean-up & Attributes by Department

Up until version 2.3, product or service master data in iPE was managed at enterprise level with one set of data per part number used by each client across their enterprise. As larger companies, with individual business areas or segments of more than $10B revenue each, adopt our tool, so the need to segregate some material master data by department, location or "plant" (as SAP calls it) became necessary. We have therefore implemented the option for our larger clients to manage separate product or service master and estimating data by department, location or plant-code, including importing plant-level data directly from SAP S/4. While taking advantage of the benefits this brings in terms of simplifying the SAP S/4 integration and allowing different estimating methodologies or costing hierarchies for the same part number between different business areas, we have taken pains to avoid inheriting the problems that this brings to SAP S/4 users, such as duplicate data maintenance and inconsistencies between plants. To avoid these downsides this is still only an option, plus our clients can manage material master data at company or segment level,

and not just at location, department or plant level as supported by SAP S/4. Any fields not maintained at the lower level are automatically inherited from the product or service at enterprise-wide level.

As well as supporting segment, company, location, department or plant level data, we have cleaned up the product and service master screens incorporating travel item specific attributes into the planning and estimating tab, splitting the cost and price book or catalogs (standard/moving average costs vs. catalog prices) into separate tabs, and adding new attributes such as default template, minimum/economic lot-size, cost distribution rule, escalation factor and quantity adjustment power curve selection (e.g. by commodity). For in-house produced, maintained or manufactured parts, we have added fields or tabs for routing or task-list selection rules, master bills of material definition and edit, and learning curve attributes such as the start/end lots for hours-per-unit reference documents like master routings or production order confirmation history, as well as the learning curve %'s to apply to future requirements based on production rates and proposal delivery schedules.

Finally, we are excited to confirm configurable pricing whereby price catalogs can be defined for products with prices not only varying over time, currency, customer/price book, but now also based on any number of options and features. For example, if you sell cars of various colors, you can set up a tag for color and maintain a price for each color of car that you sell.

Resource Group (Master Data) Clean-up

The resource group master data application has been cleaned up along with additional fields for number of employees or resources in that role, utilization/availability, forecasting group and ProPricer base resource code (BRC) assignments. The list of resources assigned to that specific resource group has been extended to show more resource and even HR data such as contact information.

Proposal (or Sales) Bill of Material Enhancements

A significant number of proposal bill of material (BOM) enhancements have been implemented primarily for our aerospace & defense and complex manufacturing clients, including:

- Improvements to the BOM selection and prioritization process including rules for scanning BOM usages/priorities across plants or locations, default and user configurable rules to include or exclude bulk items during the BOM import, and a greater variety of BOM sources including the option to maintain master BOMs directly within iPE
- Making it easier and more reliable for users to assign and import a proposal BOM (from PLM or SAP for example) guiding them through the process of assigning an estimate and WBS element to the contract line which is the proposal BOM end item
- Option to import multiple proposal BOM contract lines at once vs. individually
- Inheriting key information from the contract line down the BOM structure such as the CLIN reference and phase/set
- Support for model/unit effective bills of material whereby changes to the BOM are implemented not only based on dates (valid from…) but based on end item model/unit or serial number combinations. These are referred to as 'parameter effective' BOMs in SAP S/4. iPE can now import parameter effective BOMs from SAP, with users in iPE selecting the parameters – such as model and unit or serial – directly in the contract line

- Fixes for model/unit effective and configurable BOMs around the re-use of existing proposal BOMs for the same material or part number
- Enhancing our version 2.0 configurable BOMs where individual components can be selected (or not) or quantities calculated based on rules and what options or features are selected on the end item. You can now define a range of options or features - such as car model, engine size, color, seat material etc. - which can influence other options (defaulting, setting, hiding other options, for example), influence the price (based on configurable pricing tables) and influence the proposal BOM directly. Twenty5 is now a true project-CPQ tool with the 'C' standing for 'configure' (P=price/Q=quote)
- Support for negative BOM quantities or contract line (end item) quantities
- More options to add BOM components and material estimates to the change log, to re-cost when running 'changes since' material costing.

Independent Requirements

Commercial project-based organizations generate material demand from quotation or contract lines with proposal BOMs. Organizations using iPE for capital projects don't use contract lines, other than for the generation of asset settlement rules (explained further below). To support organizations which do not use contract lines to generate material requirements (like MRP), we have now provided an option to mark proposal BOMs as 'independent requirements' so that they are costed without an associated contract line. The schedule is inherited from the WBS assignment, while the quantity and WBS itself is maintained directly within the proposal BOM.

Generation of Independent Requirements in SAP S/4

Materials estimates, especially ones generated from contract lines and proposals BOMs, are not normally transferred from iPE to SAP S/4 when the contract is awarded, and project delivery starts. This is because the contract lines in iPE are converted to sales order lines in SAP S/4, with real manufacturing BOMs developed directly in SAP S/4 or from a PLM system feeding SAP. MRP is then used to generate material requirements for lower level BOM components as 'dependent requirements' in SAP.

Long lead-time materials may however need to initiate procurement in SAP S/4 prior to the manufacturing BOM being developed and MRP being run. For this reason, we have developed an interface to generate 'planned independent requirements' in SAP S/4 for certain long lead-time material estimates. These planned independent requirements generate procurement proposals in SAP S/4 to trigger advanced procurement, but are then automatically netted off against dependent material requirements from SAP S/4 once the manufacturing BOMs are completed and picked up by MRP.

Material Costing Enhancements

A significant number of enhancements were completed in this release to our material costing procedure – which as a reminder consolidates the various end item delivery schedule requirements throughout proposal bills of materials to generate and cost in-house produced material fabrication and assembly estimates, as well as subcontract and purchased material estimates. The main enhancement is extending support for purchased part estimates from purchase order history and standard or moving average cost in

the prior release, to now support supplier contracts, long term agreements, supplier quotations from vendor portals or sourcing applications, and manually created cost estimates such as Cost and Price Analysis documentation. The following additional enhancements were incorporated into our material costing for aerospace and defense companies as well as for larger complex manufacturers:

- Additional control via the concept of a 'costing profile' (which is stored against the estimate and/or phase/set and/or proposal for re-use in future) for material cost estimates to control more parameters that impact material costing, such as what escalation factors to apply, what special charges to consider, whether to perform quantity curving, whether to consider actual costs, and how far back to scan for production order history. Several of these attributes cover existing features in material costing and some cover new features outlined in the points following....
- More powerful rules in terms of what source documents or cost sources are considered in each estimating source - such as what document category, or type, in SAP S/4, or mapping to a customized set of 'cost source codes', the document age in years, and/or whether the document is expired, for the same segment or business area as the current proposal, and so on. There is a balance between speed and complexity, but essentially iPE costing hierarchies can be constructed to scan through cost sources in any desired pattern or rule, with the highest confidence or best fit (for purchased items) or an average of all history up to a certain age or document count (for in-house produced and/or purchased items) being computed accordingly
- Selection of the best-fit pricing condition for supplier quotations and contracts which have multiple prices spanning different contract or quotation terms (e.g. yearly prices), as well as multiple price-breaks based on different volumes or quantity ranges. When multiple end item requirements are consolidated into one material estimate, the prices for each requirement are calculated and escalated separately based on each specific end item delivery date minus the cumulative BOM lead-time offset
- Support for pricing and escalation based on anticipated (and historical) delivery date vs. pricing and escalation based on anticipated (and historical) PO placement date
- Option to limit costing to specific phases/sets, or to consolidate pricing quantity (quantity price breaks and set-up charges) with some or phases/sets in another proposal
- Support for approved supplier lists and supplier or make/buy quota arrangements
- Special charges or non-unitized or quantity-based fees for purchased items. Special charges are supplier fees such as for expediting, certification, first article inspection, packaging, tooling or engineering. Up to six categories of special charges can be detected from special purchase order lines and/or pricing conditions in SAP S/4, mapped and imported to iPE, and used as recurring or non-recurring, quantity-independent, charges in material cost estimating
- Reading of actual costs from actual purchase and production orders in SAP S/4, for example on an 'indefinite delivery indefinite quantity' or IDIQ contract, for proposals or estimates being refined on programs which have already started to be delivered. Based on the project/WBS assignments - or 'pegging' record assignments in SAP's GPD/PMMO module if that is used – iPE can determine which production and purchase order 'actuals' apply to the current proposal and pull in the actual costs for these completed production order and in-process or received purchase orders, without escalation, as the preferred cost source. Any material requirement quantities over and above what was discovered in SAP S/4 as 'actuals' continue to be 'estimated' based on our estimating methodology or costing hierarchy, as normal. There is even a report which displays actual costs not found in, or in excess of, the proposal BOM quantity
- Automatic splitting of consolidated material estimates when a quota arrangement exists to direct procurement to a range of different suppliers, or to split estimating on a % basis between make vs.

purchased portions, or when a valid and unexpired supplier contract was found as the best cost source but it expired mid-way through the requirement dates, or if only some of the required quantity is covered by actuals (see below)

- Calculation of quantity adjustment factors using a power curve in addition to our 'stepped curve' approach which was previously supported. Power curves can default based on the product/service being costed (or its commodity) or they can be automatically derived based on the spread of quantity price-breaks across a range of quotation or contractual pricing conditions in your procurement system
- Calculation of learning curve factors during material costing using industry standard power/learning curve methodologies, based on knowing the mid-point of the historical or reference history (the routing, task list or production order confirmation history sampled to derive an average hours per unit by work-center/cost center) as well as the mid-point of the required lot-size for this proposal (derived from the end item delivery schedule and current production rate or velocity). A learning curve of 90%, for example, means that the hours per unit reduces by 10% for each doubling of production, or as the mid-point of the required lot reaches 2x the mid-point of the reference historical lot
- Addition of a decrement factor for purchased material to indicate by how much the supplier's quoted price might be reduced (from further negotiation) or increased (due to hidden or missing fees) when the project is in process
- Separate complexity factors for make vs. purchased parts when referencing a similar to material in a proposal BOM
- Aggregation or roll-up of hours, in addition to cost, up the proposal BOM
- Support for customer or government furnished material and equipment, which are furnished and therefore not costed
- Enhancements to carrying forward locked or 'retained' cost sources when re-running material costing to consider and carry forward sourcing or RFP information, project change request dependencies, and special charges at the same time
- Parallel servers, running costing across multiple servers at once to support literally millions of dependent requirements from larger multi-billion-dollar material proposals.

Cost Source History Application

We have fundamentally changed the way we integrate purchasing history within procurement systems such as SAP ERP. Instead of 'viewing' purchase history directly from within your ERP tool, we now sync and copy purchase history from your ERP system(s) into iPE. This allows users to more easily integrate multiple procurement systems or databases – such as for example combining together purchasing history from pre and post-SAP conversions or S/4 upgrades, easier integration of historical supplier quotations from sourcing systems such as S/4 Product Sourcing, Ariba or Coupa, and support for manual creation of historical source documents such as manual cost and/or price analysis or corrections to inaccurate or badly input ERP purchasing history. A full audit trail is provided so that your DCAA auditor always has a direct link from the material cost estimate back to the historical source document in your original ERP system, even when that source was copied and corrected in iPE. There is even a way to open the purchasing document within your ERP system from a link in iPE.

In keeping up with all modern procurement systems - iPE supports purchase orders, contracts, long term agreements and supplier quotation cost sources, as well as manual (e.g. CAPA) documents. iPE also

supports multiple pricing conditions both unitized (quantity dependent) and non-recurring (special charges) with different price points over different timeframes or quantity ranges, as well as the option to upload and attach detailed files (e.g. PDF/Word).

Now you can have your cake and eat it – with estimators having direct access to the rich purchasing history across a range of procurement, sourcing and ERP systems, as well as the flexibility to create their own cost source history with audit trails.

Sourcing for Supplier Quotations

The sourcing application within iPE, which gathers together the purchased part material cost estimates which need to be sourced or gather supplier quotations, has been essentially rebuilt to support Truth in Negotiations Act requirements (TINA), supplier recommendation and selection capabilities (who to send RFP requests to), as well as integration to SAP S/4 Product Sourcing and SAP Ariba, in addition to our existing Coupa interface.

Material estimators can now filter their estimates based on top percentage of spend, confidence, accuracy or nature of the estimating cost source, and total supplier spend for materials not covered by a contract valid on the requirement date and/or with a commercially available 'off the shelf' price. The latter is important for anyone bidding on a US Govt. contract where full cost and pricing information is required from the supplier for any supplier spend which exceeds the TINA threshold of $2M.

Our clients use a variety of methods to solicit and track quotations from their suppliers, from emailing PDF documents, to custom in-house developed supplier portals, to commercial software applications such as Coupa, SAP Ariba and more recently SAP S/4 Product Sourcing (Ariba sourcing built inside SAP S/4). Twenty5 works with all these options, not only providing off-the-shelf interfaces to all three tools, but also helping buyers in iPE to view, recommend and select suppliers to send each RFP to, by grouping materials into RFPs or 'sourcing events' based on the buyer, commodity or recommended suppliers. iPE has access to your full ERP history of purchase orders, contracts and previous supplier quotations, as well as access in many cases to approved supplier lists, disbarred suppliers and supplier performance databases. This vast mine of information allows iPE to recommend suppliers for RFPs based on purchasing history (volume and recency), as well as based on supplier certifications and performance. Supplier quotations often span a range of dates and quantities – for example when the end client has requested as number of independent or optional sets or quantity ranges of end items. iPE can therefore track supplier quotations across a range of dates and quantities, and will always select the best-fit (most recent/highest quantity) quotation as a cost source, as well as escalating for inflation and curving for quantity adjustments.

While best practice is to select a supplier for each RFP within your sourcing tool, iPE provides the option to compare multiple supplier quotations side by side for the same RFP, add decrement (negotiation) or increment (missing fee) factors, and to select specific supplier responses for cost estimating purposes. If a supplier selection is not made in either your sourcing/RFP system, or in iPE, then the lowest cost bidder is assumed for each cost estimate.

Change Notifications

It can take our clients several months to finalize costing for large proposals with thousands of materials or parts, during which time production and purchase history is changing. iPE material costing works on the

principle of ‘freezing’ the cost estimate once it has been submitted for approval, with options to lock or ‘retain’ existing satisfactory cost sources during the material estimating process prior to submission. That said, it would be useful for estimators to be made aware of new purchase or production history even on ‘retained’ cost estimates, which might impact how they want to cost something.

For this reason, we have developed a change notification framework to detect changes in history sync’d from your production and procurement ERP systems, scanning for new, changed price or new versions of history for in-process proposals and estimates. Notifications are provided to material estimators, via a discrete notification/check rule column which uses icons, traffic light colors and tooltips to indicate if new changes occurred since the last costing run for that specific part number. Users can then click on the icon to view the changes, accept or reject (or mark as ‘in review’) and update the cost or mark the item to be re-costed in the next costing run, accordingly.

Change notifications are currently provided to detect new purchase orders, purchasing contracts, supplier quotations or changes in the quota arrangement or supplier split percentages for a given part number, for purchased items. For manufactured parts change notifications are provided to detect new and completed production orders impacting hours per unit confirmation history, routing changes and new SAP product versions. Bill of material, material master and even end item contract line delivery schedule (date/qty) changes notifications are also provided for all parts – both make and buy.

The same column is also used to provide information on our configurable consistency check rules, explained next.

Consistency Check Rules

We have also developed a consistency check rule framework which is a series of configurable rules fired on request / save, or prior to triggering an interface to another connected system. These rules are incredibly flexible and essentially provide user input and data validations beyond what is available as standard. For example, if you want all phases to be marked as optional – there’s a consistency check rule for that. Or if you want all labor estimates for offshore resources to have a grade/seniority assigned – there’s a check rule for that. Or perhaps you want all BOM components which are make parts to have sub-components – there’s a rule for that too.

Consistency check rules can be technically configured as an SQL query, as a formula expression, or using one of our expanding list of pre-delivered back-end server APIs or front-end browser methods to perform pre-delivered checks on your in-memory data prior to saving it. If you have requirements for special checks talk to our consultant; they can either create an expression or SQL view for you or they will talk to our developers to build a suitable API or JavaScript method.

Once the consistency checks are fired the results are displayed in a popup and updated in the consistency check rule traffic light icon column explained under Change Notifications, above.

Proposal Re-use and Copy Enhancements

As part of our desire to encourage best practices and re-use we have enhanced the proposal, phase and WBS copy to include options to copy from a prior (in execution or completed) project as well as a template or a prior proposal, to select tasks vs. WBS elements separately for copy, and splitting the version 2.3 option

to copy ‘estimates’ into four discrete options to copy labor, proposal BOMs, material and travel/other cost estimates separately. The copy checkbox displays have also been improved with more meaningful counts and more robust validation of selected options for what to copy.

We have also provided support during the proposal, phase or WBS copy for:

- Advanced search for historical proposals and projects including filtering results based on client-defined facets and fuzzy search, as well as rule-based template project selection
- Adding complexity factor during proposal copy, and complexity/efficiency factors during WBS copy, with complexity/efficiency factor rationale
- Swapping department during proposal or prior project copy including looking up revised resource costs and rates based on the new location or department
- Retaining a cross-reference from the master/original proposal when copying from one proposal to another, with a more toolbar button navigation option back to the original.

Proposal Categories

We extended proposal categories or classifications of the proposal header from 4 to 16 categories, with proposal categories added to the proposal and project search views. Categories are assigned to proposal header, whereas our existing concept of tags should be used to apply custom tags to the cost model at all levels of the proposal - header, contract line, WBS and individual labor or material cost estimate.

Enhancements to Depreciation and Base Term

Depreciation or amortization (for services, labor and software) has been further enhanced to provide configurable rules for the default start and end of depreciation, including options to trigger depreciation automatically based on hardware or software unit or total cost, as well as options to start depreciation from a user input date, a date input at the WBS, the project go-live date or from the start of costs being incurred for that specific estimate. Depreciation typically ends at start + term, but you can now also configure rules to end depreciation at contract end or to transfer the asset balance at the end of the contract (which is essentially a cliff-depreciation).

We have also introduced the concept of a base term which is the duration of the non-optional or base phases. Depreciation can be configured to end (or asset balance to be transferred) at the end of the base term, but only for cost estimates which are contained within the base term. Estimates which span into the optional phase terms will still be depreciated until, or transferred at, the contract end.

Design to Cost

The bottom-up estimated cost can now be copied to the design to cost or top-down cost target at any level of the WBS hierarchy. This is useful, for example, for clients who manage multiple versions or phases of a project and wish to create a new version or phase with the cost target for a specific ‘leg’ of the WBS hierarchy based on earlier estimates.

Formula Updates in Real-Time

Formula in iPE are updated when the formula is opened/edited as well as when triggering 'update cost incl. formula' in the widget or more toolbar button menu. This is generally fine since we already developed a way to run update cost in the background every few minutes, automatically. However some clients have requested formula to be updated more in real-time, so we have introduced a special formula parameter which triggers a real-time update anytime a dependent parameter within the formula is changed, like how Excel works. These formula - which can often be extensive in nature and thus slow to update - are also removed from the 'update cost' algorithm which has the added benefit of improving the 'update cost' performance at the same time.

Other Formula Enhancements

- More control over when formula costs are distributed with options to distribute formula costs based on the underlying direct costs, based on the up-front costs, or based on the maintenance cost distribution profile.
- Minor fixes to the formula set-up application, especially the adhoc formula creation popup which end users can trigger from within a proposal.
- Automatic generation of the formula rationale text, for inclusion in the basis of estimate, to explain how the formula was calculated with embedded description of formula inputs, results and assumptions.

The formula set-up application will be completely refactored in a future release to use AI-powered formula generation based on industry best practices and predictive analysis of costing history.

Settlement Rule Generation

Capital project management in iPE often entails the creation of complex settlement rules in your SAP financial system to allocation actual costs in the project and WBS to your capital program assets based on pre-defined rules and percentages. You can now set up these rules as end item assets directly in iPE, including allocation of WBS costs on a percentage basis or one or more assets at any level of the project's WBS hierarchy. You can also limit how these rules are configured in iPE, for example from WBS to WBS, WBS to asset, cost center to profit center etc. Finally, the settlement rules are seamlessly interfaced to and created in your SAP system avoiding the need for manual creation of these complex rules in SAP.

Planning vs. Execution WBS

Once estimating is nearing completion and the proposal or capital project request has been approved, it is typically converted into an executable project for execution in your SAP ERP or project management system, with the option to track plans, funds, risks, forecasts and project changes through the delivery life cycle in iPE.

In practice, especially for larger programs, this is not a linear process. Earlier project phases are completed before estimates for the later phases are developed. It is not always practical to transfer the entire project from a planning to execution phase, or rather, once the project is in execution the planning and estimating

continues. For this reason, we have developed the concept of converting individual WBS elements and hierarchy 'legs' from planning to execution, allowing you to restructure the WBS and task hierarchies during the execution phase while retaining planning structures and estimates for reference purposes in future project estimates. Using our mass edit capability you can update the WBS/task assignments for your estimates and resources once execution starts, but retain the original planning WBS/task assignments.

Project Change Requests

As well as extending workflow to project change request approvals, we have also enhanced the user interface when selecting or creating a new project change request including giving the user to option to link the project change request to one change vs. all subsequent changes made in the same user session or proposal. We have also provided a link from project changes to funding sources and risks, including the option to require a funding source for anything changed with respect to a project change request.

Several fixes have also been applied to our project change request module, as we see our first clients starting to use this feature in production.

ProPricer Integration

ProPricer is a pricing tool used by many larger aerospace and defense firms for submittal of proposals in a Govt. mandated format. While Twenty5 supports all the features supported by ProPricer and much more, we also provide integration to ProPricer for users who have been using ProPricer for decades and do not wish to change. Our consultant can very quickly tweak the SQL views used in our application, which are delivered free of charge with the product and not as an extra-cost item, to create ProPricer .tsk and .res files either as downloaded files (for manual upload into ProPricer) or via a direct API request into your ProPricer web server. iPE provides support for ProPricer's distribution rules or discrete monthly values, calculation of factors and cost estimating relationships in either iPE or ProPricer, complex mapping of ProPricer task and base resource codes (BRCs) and custom tagging to support any client-specific tags built into ProPricer.

Rules-Based Selection

To support client requirements for more sophisticated rule-based determinations of default proposal templates we have built a rules-based selection process whereby consultants and system admins can set up rules for the selection of proposal templates, escalation factors, quantity curves, workflow templates and ProPricer base resource codes based on:

- Proposal or project type
- Resource group, role or group type
- Product or service code, commodity or type
- Cost element or account
- Company or department (organization delivering the project in other words)
- Major vs. minor proposals
- Total proposal hours thresholds

- Subscription vs. non-subscription items.

Cost/Price Analysis Dimensions

The following dimensions have been added to the cost/price analysis tool:

- Adjustment Contract Line (adjustments were added in version 2.2)
- Customer Role (for labor bill rate determination)
- Forecast Group
- Grade/Seniority (for labor cost rate determination)
- Project Change Request impact yes/no
- Sourcing Event.

Risk Management Enhancements

Some minor enhancements to the risk management application in Twenty5 include:

- Improvements in linking risk to WBS elements in both iPE and directly from SAP
- Justifications when adjusting risk management reserves
- Tracking the original risk cost impact (prior to being edited due to mitigations).

We are in the process of developing a RAID log.

Data Import/Export Utility

An exciting new development in this version is our data import/export workbench which allows consultants (currently … this will be rolled out to client system admins in the near future) to configure custom or tailored data imports and exports to/from MS-Excel, Google Sheets, CSV or TSV files. Sophisticated mapping from both columns in multi-sheet Excel documents as well as to individual cells on summary Excel sheets, allows data to be mapped from literally any format to tables and fields within Twenty5. While Excel is limited to around half a million records, our CSV/TSV support enables millions of records to imported into Twenty5 in minutes. Not only can any cell or column position or name be mapped to any table/field in iPE, this utility also provides support for:

- Data conversion or transformation during upload, such yes/no to Boolean
- Mapping of numerous date/time formats
- Field value mappings allowing values in your legacy such as legacy SAP ECC plant codes to be automatically mapped to new values in your new iPE system such as revised new set of SAP S/4 plant codes
- Triggering of custom checking rules and API-based updates, such as looking up the resource group cost and billing rate and calculation of total cost and T&M revenue when uploading labor, following the upload

When it comes to exporting data down to multi-sheet Excel documents, our data export utility allows any data from iPE to be downloaded to Excel in any format. Either download tables you can see in our apps, or directly from our database, or quickly develop SQL views to aggregate, summarize and join data in iPE to

connected systems such as your CRM or ERP, and download the results directly into a customized Excel file or template with formatting, summary or pivot tables and even charts which automatically summarize the data exported and downloaded from iPE, in real-time.

To compliment this utility we have enhanced all of our grids where Excel upload or download is enabled to allow system admins to upload new templates directly to tables you can see in the screen, or to upload larger volumes of data directly from Excel in search lists. We have extended our screen control set concept to combine output forms or PDF outputs, external report links or URLs to PowerBI or SAP Analytics Cloud (SAC) dashboards, and our data export templates, into one concept. You can now configure your own report output menus and sub-menus, by application or screen control set (proposal/project type, user role etc.), with each menu or sub-menu invoking a PDF output form, Excel download or external reporting dashboard URL depending on how it has been configured.

Workflow Extensions

As well as some fixes to our workflow setup application (where consultants and system admins can configure, copy or tweak workflow networks and rules), we have enhanced our workflow regarding:

- The scope of roles, including multiple role-based owners working in parallel (first to approve)
- Support for parallel steps going to different owners including rule-based connected (all need to approve, approvers based on target margin or threshold value etc.)
- Integration of APIs and system interfaces to workflow steps, and extension of workflow and approvals to project change requests and price books
- Cosmetic enhancements and fixes to the Pursuit Milestones or Due By tab.

Integration Framework

Twenty5 now has around 50 interfaces to and from various CRM, ERP, PLM and project management or resource management systems such as SAP ECC, SAP S/4, Salesforce, MS-Dynamics CRM, Cora, Cognitus and ProFinda. To better manage this complexity, we have rebuilt our integration framework and the way our interfaces are run to support system admin. configuration of how interfaces are triggered, either as regular background jobs at pre-defined intervals, based on workflow status changes or at user request, or based on events.

The same console also allows system admins to test run and monitor each interface. Interfaces can be point to point (i.e. direct links from iPE to the connected system) or work via an integration messaging framework such as SAP's CPI or 'Cloud Integration' as it is now termed.

Version 2.3 - November 2023

Labor Rates Workbench

Billing rates are the lifeblood of most professional services firms, especially firms who do time and materials based work or target price work with T&M rates x hours making up the fixed price. To supports these firms, Twenty5 developed a labor billing rates workbench to store and manage your company's standard rate

books, customer or market-specific pricing sheets and all of your master services agreements (MSAs) or client's specific price books or rate cards.

There are two key concepts under-pinning the labor rates workbench in iPE – price books and rates.

1. Price books represent each company rate card, market-rate sheet or customer-specific MSA; price books can be associated with a proposal header or contract line, and organized based on customer, customer group, region, channel or market (the client-facing dimension), based on service offering, group of services or service commodity code (the service-offering dimension) or based on your internal organization (the internal dimension)
2. The rates within a price-book represent individual billing rates for your resources. Rate cards (price books) are selected per the criteria above and within a price-book, rate card or MSA the rates can be defined based on resource group, supplier/resource or named resource (the resource-type dimension), based on the client role which is loosely connected to your internal resource hierarchy but does not have to be an exact 1:1 match (the customer's view of resource-type dimension) and based on time (for example for rate that change from one calendar, customer/MSA or fiscal year to the next, the time dimension)

Furthermore, you now have the flexibility to define rates that change on specific dates as far ahead into the future as you require and then have the iPE system automatically escalate these rates based on annual calendar or fiscal escalation indexes beyond the end of the billing rate validity. The Labor Rates Workbench also supports mass upload from XL and integration to create and update SAP pricing conditions for T&M billing rates both for project-specific and company/market/MSA rates.

Labor Cost Rates by Band

Up until version 2.2, resource groups were defined in iPE for each cost rate, much the same way that S/4HANA defines an activity type/cost center combination for each cost rate. With version 2.3 you now have the option to define resource groups at a higher level – resulting in fewer resource groups – and then define cost rates within a single resource group by grade or cost band, as well as by department or location. This way you can model your resource groups around capacity planning and staffing requirements, and your cost rates around cost band, location/site and/or seniority. When combined with the ability to define billing rates by customer role as explained immediately above, iPE has taken two huge steps to enhancing the flexibility of your cost and rate structures, with neither cost or billing rates being hard-tied to resource groups, a restriction which is present in other project management planning tools.

Price Books by Contract Line

Price books can be automatically determined in the proposal header, based the customer, region/channel and other factors, or copied from a template. At the same time price books which are specific to service offerings can be assigned to the contract lines, with labor and material billing rates being automatically computed based on, by default, the contract line which the estimate's WBS is primarily assigned to. Contract line price books or rate cards can be automatically selected based on the service offering or commodity, manually selected on the contract line, or manually selected in the labor or material estimate.

Non-billable Labor Estimates

You can mark labor as non-billable which sets the T&M equivalent billing rate to zero, for T&M pricing / revenue purposes. The non-billable flag does not influence the cost.

Material/Other Estimate Pricing

In prior versions until 2.3, material or fixed price service fees which were billed to the client were either part of an overall fixed fee arrangement, or separate contract lines would need to be created for each material such as hardware or software which is billable to the client. Creating a contract line (for the revenue) and a material cost estimate (for the cost) theoretically made sense but confused several users. Consequently, we now have created the option to price materials and services from within the material or other cost estimate, by adding separate columns for the prices on top of existing columns for the costs. These prices then automatically roll-up to the contract line in the same way that the T&M billing rate for labor estimates rolls-up, allowing the price to either mark-up these fees, or price the contract line directly based on these fees, according to the selected pricing strategy.

Single-App Concept

While larger proposals and projects benefit from the proposal and estimates being managed by different people in iPE, for smaller projects or engagements users must remember to click the “open” link in the cost structure tab to access the single project-wide estimate. In addition to making it easier to open the estimate from the proposal (and to return), we have also rebuild the following tabs within the proposal app itself, so that it is no longer necessary to switch to a new browser tab.

- The cost-price analysis tool cost and revenue pivot table is now available as a tab within the proposal app
- The labor rates summary table is now available as a tab within the proposal app and is being enhanced to support variable row-basis (e.g. by phase or price book as well as by resource group) and column basis (e.g. by calendar or master services agreement rate effectivity as well as by fiscal year)
- The labor estimate is in process of being moved to the proposal app for smaller projects
- The other costs estimate will be moved next to the proposal app, again for smaller projects

ChatGPT AI Integration

Twenty5 has built an interface to ChatGPT to carry out proposal and estimating related tasks such as constructing a work-breakdown structure for your proposal. Rather than simply rely on the user to ask the right question, our ChatGPT integration allows the implementation team to pre-compile a questionnaire style user input and then formulate the ChatGPT question behind the scenes and process the results from text to correctly formatted data objects in iPE. For example, our AI integration for WBS cost structure generation asks for the WBS to be structured based on iPE’s numbering conventions, with appropriate start and end dates, so that this can be automatically converted into the cost structure or WBS hierarchy in iPE.

Cosmetic Improvements

We have introduced the option for tab icons as well as labels, as well as modifying how tabs appear in the main app vs. in popups, to improve the look and feel of iPE. Other cosmetic enhancements include:

- The expand/collapse icon in the estimating app was also changed to be the same as the proposal app
- The + button to create a new proposal or risk has been replaced with the word NEW to make it easier to differentiate this from the + button to add a new filter
- The lock (edit mode) and unlock (display mode) icons have been replaced with the words EDIT and UNLOCK to make it easier for the user to understand
- Next/previous buttons in the material estimating popup for one material (e.g. hardware/software/service) estimate
- Next/previous buttons in the proposal app have been improved, with clearer logic for previous on the first tab (cancel/exit) and next on the last tab

Display of Client Logo

We have also introduced the option to upload and display a client-specific logo in the top left corner of the application to make it more personal. We are now working on the option to modify the top banner color to match the logo background color.

Version 2.2 - January 2023

Build Version Display

The help menu of the application has been expanded to show the current build version. This is very useful for example when clients need to track exactly which version was deployed where and when. For SAP BTP installations we have also implemented Azure DevOps deployment workflows to track and approve deployments to DEV, QA or PROD instances using email.

S/4HANA Public Cloud Interface

In version 2.2 we developed an out of box interface to S/4HANA public cloud 'cloud for projects' for professional services companies. This interface creates the project, work-packages and work-items, and all the labor and non-labor resource demands at each work-item including the distribution of the labor over the work-item's timeline by week or month. These interfaces are available out of the box as part of our standard integration and published as iFlows at api.sap.com.

People familiar with S/4HANA public cloud for projects may be aware that S/4HANA out of the box supports manual planning for labor by month but not by week. To address this gap Twenty5, SAP and ProFinda - which is SAP's recommending staffing tool for professional services companies - jointly developed a weekly planning option for S/4HANA public cloud as a custom development (weekly resource planning comes as standard with Twenty5 and ProFinda). We now have multiple options for how the resource demand data is transferred from iPE to S/4HANA and in turn to a staffing tool such as ProFinda; based on manual planning

by week or month, or based on distribution using a curve with planning by week or month in S/4HANA and the staffing tool.

Not only do we create the project, work-package, work-items and resource demands by week or month, but this interface also updates the sales order header and items and the individual price conditions with T&M labor rates for each resource are created automatically in S/4HANA public cloud editionNot only do we create the project, work-package, work-items and resource demands by week or month, but this interface also updates the sales order header and items and the individual price conditions with T&M labor rates for each resource are created automatically in S/4HANA public cloud edition.

For S/4HANA private cloud edition customers, we enhanced our existing SAP project/WBS/baseline creation interface to also create networks, network activities, network activity material component reservations, sales order items with pricing, billing plan items and labor rate or service offer price conditions.

Additional Project Dates

We have added more dates to the proposal in addition to the existing fields for project creation, response due, read history up to, and RFP receipt date - in the ADVANCED tab new dates for:

- Anticipated project go-live date, which impacts the start of depreciation as well as key billing milestones or revenue recognition rules (contract lines)
- Escalation from, which impacts when escalation starts, to ensure a fixed date vs. always escalating from 'today's date' until the future delivery/project schedule dates (see a more detailed description of escalation enhancements below)
- Contract sign date - either when it will be signed (close date in CRM) or when it has been signed (for execution)

Labor Planning by Skills

As well as planning by resource group, sub-contractor, location, grade or seniority, named resource etc. you can now also plan for resources based on specific skills. We have combined the ability to select skills from a drop-down list (imported from your company's skills database or from the skills catalog in your staffing tool) with the option to type in free text to further explain what skills are required and under what conditions. This information is then, in turn, interfaced across to S/4HANA and your staffing tool as part of the resource demand interface outlined immediately above.

Other Labor Enhancements

Other enhancements to labor planning include:

- Filter of resource groups by cost center as well as department
- Option to hide certain resource groups from selection even though they can be automatically defaulted based on the assignment of a named resource
- Revisions to how billing and cost rates are maintained as well as tracking estimates where billing and/or cost rates have been updated by the user directly in the labor cost estimate

- Ability to select a supplier for sub-contract labor, as well as a named resource for person-specific labor, and to determine or edit the cost rate accordingly
- Customer role (billing rate code for customer role-based price books) and customer role description columns
- Non-billable column
- Configuration options for the number of decimals to display for labor hours, days and full-time equivalent (FTE) calculations
- Column locking (equivalent to 'freeze panes' in XL) and row grouping with sub-totals

Flat Distribution Curves

The 'linear' distribution curve in version 1 of iPE distributed hours and costs based on the number of calendar days in each month, divided by the total number of calendar days, so that in effect longer months had more effort than shorter months. This makes sense in theory, but some clients wish to plan exactly even months, and some clients who do want variable length months need to calculate efforts based on working days not calendar days, especially when converting from full-time equivalents to hours. As a result, Twenty5 enhanced the distribution process in iPE to work based on working days (days in month minus weekends and minus public holidays for that resource group's work calendar) and introduced a second linear distribution curve option which creates an exactly equal number of hours in every month.

Project Forecasting

Version 2.2 brings more project execution and delivery functionality, a significant portion of which is our forecasting module. iPE can now import actual labor and material costs, commitments and WBS cost structure changes from S/4HANA during the project execution, from timesheets, purchase orders and goods/service receipts posted directly into S/4HANA - both public or private cloud editions. Rather than forcing project managers to forecast at the detailed resource or material level, we have introduced a concept called a 'Forecast Group' which is essentially a group of labor resources and/or materials, perhaps by resource class, type or material commodity, for forecasting purposes. Forecasting is then carried out at the forecast group level combined with either the work-package, WBS or task level from the WBS cost structure, giving project managers the maximum possible flexibility for what level to forecast at.

This concept is useful if, for example, you plan and estimate the project at a more detailed task level but the timesheet collection 'codes' in your SAP or bolt-on timesheet system are at a higher level of the WBS, perhaps at work-package or work-item level. In this scenario forecasting by task would be impossible, since forecasting requires a comparison of planned vs. actuals to work properly. The forecast group concept, combined with flexibility as to what level of the cost structure to forecast at, makes it easier to align your forecasting strategy with how actuals are collected.

Another key concept of forecasting in iPE is the forecast cycle which can be monthly, quarterly, annual or ad-hoc at any time and creates a new snapshot of the forecasting data. Typically, each forecasting cycle begins with automatically 'rolling over' the difference between actuals and planned/forecast efforts from the previous cycle, for the current period where timesheet and goods/service receipt data has been collected in S/4HANA. What is rolling-over? If the actual costs for the current period exactly matches your plan or most recent forecast then there is nothing to roll-over; but if your actuals are slightly less than the plan then a positive number of hours, quantities and/or cost must be rolled-over and added to the future

forecast to ensure that estimate at completion is consistent. Conversely if actuals costs were higher than the plan for the current period, then the future period hours, quantities and/or costs must be reduced slightly to ensure no change in estimate at completion from the roll-over process. You can define as part of your forecasting method for your project or sub-project/WBS the roll-over strategy, whether to add or decrement the rolled-over costs from the very next period (and subsequent periods if the next period is completely drained as a result of a rolled-over decrement in excess of the next period's plan), or to add or decrement the rolled-over costs from the labor period (and previous periods), or whether to apply the roll-over variance fairly and equally across all future periods in proportion to their current forecast values. You can even assign a distribution curve to the roll-over strategy to distribute the roll-over variance according to 'what is left' in a distribution curve applied across the entire duration or each WBS or task.

Update Costs & Prices

The more button menu to update costs and prices, including formula based costs, has been cleaned up to make it clearer for the end user, together with a very handy widget or tile which informs the user exactly when update costs/prices needs to be run (with a link in the actual widget to run this process). In addition, Twenty5 has developed a program to automatically run update costs and prices in the background, every few minutes, thereby saving the user from having to remember to run it. Please note that there will still be a small delay of a few minutes (depending on how your system is configured) because updating all formula and rolling costs up the WBS hierarchy and contract lines, with repricing and recalculation of recognized revenue for each contract line, does take some time as it is project-wide.

Proposal More Button Menu

The proposal/project app 'more' toolbar button menu is configurable using the screen control set logic outlined in our version 2.0 release notes, but even the basic menu has been cleaned up and expanded with a sub-menu for "Open" (giving access to options like opening the cost-price analysis tool, estimates or sub-projects, sourcing plan, planning parameters and deleted items folder) as well as the above mentioned modifications to the menu to update formula based costs and/or prices.

Visibility of Costs Up to Date

The costing workbench has been enhanced to clearly display to the end user if costs are still in the process of being updated (in which case the user must wait for the count to go down to zero to see up to date costs, something which only takes a few seconds) or if costs have been updated since the costing workbench was opened (in which case the user should reload unless the system does it automatically).

Escalation Enhancements

Several enhancements to how labor and material costs are automatically escalated were delivered in version 2.2 including:

- The ability for escalation rates or indexes to be defined by fiscal or calendar year, with the new annual index triggered for costs incurred from the first month of the new calendar or fiscal year respectively
- The ability to define 'full-year escalation' or 'flat-lined' escalation throughout the entire year. Version 1 escalation was calculated monthly, with the escalation or inflation cost increasing by approximately one twelfth (adjusted for compounding) of the annual rate each month. The full year escalation option, when activated on the proposal or project type, ensures that the same escalation rate or % is adopted for all months during a calendar or fiscal year
- Introduction of the escalation-from date as explained in the release notes for new date fields, which also defaults to the proposal creation date if not specified in the ADVANCED tab. Escalation always runs from the later of the escalation-from or the valid up-to date for the source cost (e.g. the PO or vendor quotation validity up to, or the labor rate validity up to)
- New columns added to the labor, material and other cost estimates for the 'source document date' (the valid up to or escalation from if earlier than ADVANCED tab date, as explained immediately above), and the 'source unit cost' (the original unit rate or cost unchanged by escalation or currency/unit of measure conversion)
- Enhancement to how escalation appears in the labor, material and other cost estimate, to avoid the issue in the previous version of the escalation being different in the estimate vs. in the cost-price analysis pivot table. Now the escalation or inflation is initially calculated in the estimate using the mid-spend date concept, and then recalculated as soon as cost-item generation has been completed, on a more accurate monthly basis
- Separation of future escalation costs from direct/indirect costs in the cost-price analysis tool via selection of the 'Cost or Revenue Component'. Historical escalation, or escalation from the historical source purchase order date until the escalate-from or proposal creation date is still counted as part of the direct cost (in today's money in other words). However, the future escalation, from the escalate-from, or valid up to or PO source date if later, until the contractual required/PO placement/labor incurred date based on the proposal schedule and bill of material lead-time offsets, is recorded as a separate cost of revenue component called 'inflation cost'. This also supports separation of proposal or project P&L from EBITDA reporting
- Escalation rates or indexes, while initially loaded from a suitable web-site to a configuration table in iPE, can now be manually edited by authorized users. Simply open the SETUP tab of the proposal and click on the Edit Rates link above the company or segment, the place where in version 1 currency exchange rates were edited. Now there is a second tab in this popup called "Escalation Indexes" where you can manually edit any escalation index adopted in your proposal, as a proposal or project-specific rate, for any calendar or fiscal year. You can also make various mass updates such as setting all factors to 1 (equivalent to turning off escalation for that index), copying the index from the first year to all project-years, or resetting the index values back to the standard ones vs. the ones which you edited
- Some improvements to how escalation indexes are defaulted. Now the index is selected first based on a specific escalation index assigned to the product/service (for material/other estimates) or labor resource group (for labor estimates). If none is assigned then the escalation index set-up for the company, or the site or department, or the country or the currency is defaulted instead, in that order. You can even mark a specific product, service or labor resource group as 'do not escalate' which means that any rate defaulting per the company, department, country or currency is wiped out by default. Finally, you can always change the escalation rate manually on a specific estimate

and drag-down your index selection across multiple rows of the estimate. Work with your implementation consultant to define the correct default behaviors

Cost of Living Adjustments

Cost of living adjustments (COLA) represents costs which vary from year to year, or from region to region, based on COLA indexes. COLA factors can now be maintained in the same place as proposal-specific escalation indexes to either increase or decrease inflation factors considering COLA indexes.

Revenue Recognition

Revenue recognition in iPE was already extremely powerful, with support for accrual or delivery-based revenue recognition, percent complete based revenue recognition for long-term contract accounting (where the revenue profile follows the cost profile) and cash-basis revenues, based on billing milestones. Additional improvements to revenue recognition include:

- Percent of completion revenue recognition has been further enhanced to build in an option which excludes material costs and only considers labor and subcontract service costs, to avoid expensive up-front material procurement costs 'skewing' the apparent percent complete over time
- The option to define a hold-back % or percentage of revenue that is held-back and not recognized, as well as hold-back release method such as release at the go-live, at the end of the contract, or at a specific billing milestone or key date
- The option to define discrete quantities over time to spread accrual-based revenue accordingly
- See also Adjustments below

Proposal-Specific Payment Terms

Payment terms - which normally come from the customer master and if not specified on the customer, then from the primary company for the proposal - have been enhanced to support contract or proposal-specific payment terms.

Formula-based Pricing

Prices for contract lines can now be defined based on regular or MVEL formula expressions, with any number of price formula inputs being captured in the same contract line. In this way outcome-based or benefits-based pricing can be modelled, using our price formula expressions and pricing input parameters.

Adjustments

Both costs and revenues can be marked as adjustments which means that they are reported separately and do not impact cashflows or generate billing milestones. At the same time, negative costs, revenues, hours or quantities are now fully supported.

Estimating Usability – Locked Columns

You can now lock columns in your labor, material or other cost estimate to ensure that as you scroll horizontally, for example across the weeks or months in labor planning, the left-most columns do not scroll out of view.

Estimating Usability – Grouping Rows

You can now group rows in your labor, material or other cost estimate to organize the planning data for improve readability and usability, including calculation and display of sub-totals for each group. For example, you can group the labor or material rows by work-package or WBS showing sub-totals of total hours or cost by work-package or WBS, or instead group by resource group across all of its assigned WBS elements or tasks.

Stakeholders by Contract Line

Members of my team or response team members can be assigned as specific rows such as owner, engagement lead etc. to each contract line.

GANTT Task Schedule

Version 2.2 also introduces a GANTT view of the cost structure and WBS/task schedule in iPE with the ability to schedule tasks and WBS elements based on constraints such as finish-start relationships between tasks in a graphical view. Users can also create new tasks and edit task information from the GANTT view, to supplement rather than replace the current WBS hierarchy table layout. Some of the recent enhancements to the WBS hierarchy – such as controlling and defaulting the correct WBS-task type (e.g. phase > milestone > task) based on your company's policy – are also part of the GANTT. While iPE already supports file-based Primavera P6 and MS-Project integration, we are now working on real-time integration from the GANTT view to both P6 and MS-Project.

Authorization Enhancements

Edit and display access levels have been separated into two separate attributes for the user's job role and app combination, giving greater flexibility over precisely what proposals or estimates someone can view, vs. edit. At the same time, the user profile fields for company and site/department have been enhanced to control access by Segment. In addition, authorization for templates have been improved, and company level access now includes documents which the current user owns.

Version 2.1 - August 2022

Cost Center/Profit Center

Enhancements were made to the cost and profit center in iPE, which in version 1 were mostly free text information fields. Now you can map and sync. cost and/or profit centers to SAP organizational units

capture changes made in SAP over time, you can define relationships between company/segment and cost or profit center, and between department or location and cost or profit center and set up rules to filter and automatically default one from the other. In addition, the cost and profit center values are automatically cascaded down from the proposal header to the cost structure or WBS, and then in turn to labor, travel, material and other cost estimates, in the same way that company and department were previously cascaded and defaulted. Cost centers can be automatically defaulted from the resource group and/or used to filter resource group selection, much like how the department column works today.

Work Package in Estimating

Version 1 allowed clients to mark as specific layer of the cost structure as a 'work package' along with checkboxes for 'estimate', 'billing element', 'control account' and 'task'. While in version 1 you could report on costs in the cost/price analysis pivot by work-package, WBS or task, estimating was only performed at WBS level, with the additional option of task for labor estimating purposes. With version 2.1 we have applied three WBS-task levels to your estimate: the work-package, the WBS and the task - consistently across labor, material, and other cost estimates as well as to the estimating bill of material indented structure app. Now clients can choose at what stage of the proposal or capital project life-cycle they wish to plan at work-package, WBS or task level, as well as using the Screen Control Layout option outlined above, to modify the names of these columns to match each client's policy and naming convention.

WBS Type Defaults

Different clients call the various levels of their cost structure different things, from clients using S/4HANA public cloud edition (which restricts the WBS to work-package and work-item) to clients who have business policies and naming conventions adopted (for example phase, milestone, task). To support these different clients, we have introduced a configuration for the default WBS-task type, at any level of the structure, as well as for the allowed WBS-task types at any level. So working with your implementation consultant you can control what WBS-task type is adopted at each layer or level of your cost structure and what flexibility you want users to have to change this. This configuration can also be changed by proposal/project type.

Workflow Engine Refactor

The workflow engine in iPE was refactored in version 2.1 to support role-based approvals, notifications and escalations which not only cover the person responsible for the proposal, estimate or for approving the cost estimate, but now also cover any team member or proposal stakeholder based on the role selected for each team member, as well as any stakeholder or owner of the proposals' department or company code/segment. This increases flexibility significantly.

At the same time as part of this refactor, iPE workflow now supports parallel steps, whereby one step or status can in turn branch out into multiple parallel approvals, each with distinctive owners or approvers based on team role. The workflow process automatically waits for all these parallel approvals to be completed before moving onto the next state.

Another enhancement we did at this time is the ability to link two different workflows together, whereby an update in the status of say the proposal, automatically releases all the associated cost estimates, or funds.

Conversely the proposal might not be able to be submitted until all the cost estimates or funds have been approved. This inter-link between two different workflow networks is entirely configurable and flexible.

We now have clients using workflow on proposals, estimates, sub-projects, risks, funds and sourcing events, taking advantage of these new features as well as our existing workflow features from version 1 which include email integration (with configurable email subject and body instruction texts including embedded fields in both), configurable workflow networks with any number of status codes, inter-connections, approval levels and loop-backs and scheduling for workflow actions either forward scheduled (so many days from receipt of or completion of the prior step) and backward scheduled (so many days prior to a key date).

Finally, one of the most exciting enhancements to our workflow engine for our clients are conditional approvals, whereby rules or conditions can be assigned to specific steps or branches, for example if the cost estimate is above $X then send to one person vs. to another person is under $X or X% margin.

At the same time as making enhancement to our workflow engine, the project MILESTONES or DUE BY tab has been enhanced to show the various workflow steps more clearly, with the option to 'set' steps from within the DUE BY table itself as well as from email or from the status control in the top right corner, and to make it easier to see the role-based vs. manually overwritten owners, any relationships or links to other workflow and any conditional approval steps. The option to group workflow steps by milestones has been deprecated as it was not being used. Tooltips are also provided to help explain why a particular workflow step is not allowed, for example due to a conditional approval, or the user having the wrong role etc.

Workflow Configuration

Twenty5 has built an XL-based workflow template which a system administrator or implementation consultant can quickly fill out and then upload to iPE to build the workflow template used in subsequent documents having this workflow, as well as a workflow customization application where the administrator can modify the configuration of the workflow steps, owners and connections.

Improvements to My Team

At the same time as enhancing the look-up for roles in the MY TEAM page, some bug fixes were applied to how the proposal creator/owner is assigned to the team when 'only access to people named below' is checked. We also allow the columns of the MY TEAM tab to be saved in a view. Finally, we added a new column for 'display only access', for individual team members in this proposal who can only view, not edit, a confidential project.

Project Change Controls

Change orders or project change requests (PCRs) are planned changes to the project resource plan (cost, schedule, risks, fees etc.) or fees (contract lines) which need to be approved and tracked separately. Unlike project or proposal versions, which make a snapshot of the entire proposal, change requests can be applied surgically to specific labor or material estimates for cost impact analysis and evaluation prior to approving and even applying, each PCR.

We have introduced a new tab within the proposal for CHANGES & VERSIONS to list and manage project change requests, including change request workflow approvals, as well as noting whether each change request has been 'applied' (i.e. the change is now part of the project baseline) or not (the change is tentative). You can also assign a probability of success to each change before it is applied. Following the creation of a project change request, the user makes edits to the labor, material, travel and other cost resource plans - including creating new estimates brought on by the change, removing or deleting estimates removed by the change, and adjusting estimates with reference to the change where the system deletes the old estimate and adds the new changed record for the user. iPE then calculates the total cost and revenue impact of each change request, in real-time, a very useful feature to understand the scope of the change as well as when funding the change from a fund or risk. Change requests or PCRs can be in turn linked to a fund or a risk. Indirect, support and other formula-based costs can also be recalibrated based on each change request - with the change's impact to the base cost which the formula uses or applies a rate to (for cost estimating relationships, for example) being automatically calculated for each combination of tentative (unapplied) PCRs.

While it is quite common to have multiple project change requests open at the same time, it is also possible to create a change on top of another change, whereby the result of one change request is changed further in another request. iPE automatically keeps track of dependencies between change requests and whether one change can only be applied in conjunction with a predecessor PCR.

While change requests are rarely used during the initial bid cycle, they are used sometimes during final negotiations and especially during project delivery. By introducing this feature, alongside our project risk register and project forecasting module, we have built a layer of project delivery and execution functionality, to supplement S/4HANA project systems and S/4 cloud for projects.

Depreciation & Amortization

Depreciation (for hardware and software) and amortization (for labor and services) has been introduced with version 2.1, allowing clients to record a labor, service or material cost estimate which is 'incurred' over one set of start/end/distribution curve dates and then in turn depreciated or amortized over a completely different set of depreciation start/end/depreciation method dates. For example, a labor estimate to build something of value might be incurred over 2025 but then following the project go-live in January 2026 is fully amortized using a straight-line depreciation method over the next three years, from Jan 2026 until December 2028. Or a piece of hardware, software or capital item which is procured in, say, March 2025 for $1M, when the cost is incurred, is then depreciated on a declining balance basis over the next five years until March 2030.

iPE records the amortization/depreciation costs separately to the incurred costs (and also separately to the cashflow which is incurred + payment terms) so that the user can easily report on the project P&L - which includes and takes into account the amortization or depreciation schedules and associated shift of costs in time - or on an EBITDA basis. EBIDTA stands for 'earnings before interest, tax, depreciation and amortization' or put another way shows how the costs are incurred vs. how they are depreciated or amortized, ignoring interest and tax.

Some special features in iPE for depreciation include:

- An optional residual value for the product at the end of the depreciation term

- The option to start depreciation before costs have been fully incurred, with the result that the depreciation value is calculated as the previous month's depreciation (for straight line depreciation) plus the new month's incurred cost, depreciated over only the remaining term
- The ability to automatically start depreciation from the project go-live date (in the ADVANCED tab of the proposal)
- The ability to automatically transfer the asset value at the end of the contract, to the client, which causes the remaining value of the product to be fully marked down in the last month of the contract
- Support for straight line, declining balance, sum of year digits or unit of production depreciation methods
- Ability to automatically turn depreciation on or off based on either the unit cost or the total cost of the product exceeding a threshold value which is defined by product/service type (e.g. commodity, hardware, software)
- Ability to default the depreciation term from the product/service type or from the depreciation method
- Ability to define a 'cost deferral method' at the WBS or cost structure and then automatically cascade the amortization or depreciation method, and term, down to all impacted labor and material cost estimates

Amortization works similar to depreciation but is for labor and services, and the amortization typically starts either from the project go-live date, or when the labor costs have been fully incurred (whichever is later). The same enhancements for depreciation listed above apply to amortization, with the exception (for labor specifically) of replacing the ability to automatically transfer the asset at contract end with, instead, automatically setting the end of the depreciation term as the contract end date, so the labor is amortized smoothly down to zero by the contract end.

Subscription Sales

Version 2.1 introduces subscription fees for revenue, whereby a contract line for a subscription, lease, rental or recurring service can be defined in terms of the up-front or installation cost, monthly/quarterly/annual maintenance fees and any no-charge, trial or warranty period. You can even define different volumes over time periods, for example 100 users at $X per user per month for the first year, then 200 users in the second year, and so on. Revenue is automatically recognized over the same time-frames in line with IFRS subscription or lease accounting rules.

At the same time as defining subscription items, users can also define delivered products or services which are delivered over time. Version 1 supported a delivery schedule or series of discrete dates, while version 2.1 introduces deliveries on a continuous basis between two dates. Once again, if revenue is recognized on an accrual or as-delivered basis, assigning the delivery schedule continuously over time allows the user to spread recognized revenue according to the start and end year/month together with the volumetric quantity of services being provided over each time-block. This provides important flexibility in how to recognize revenue for different contract lines.

Subscription Costs

In line with sold subscription services, we have also introduced subscription costs or materials, such as software, rented, leased used over time in the delivery of a project. Like a sold subscription, users can define

software or other recurring cost items in the project estimate as materials with an up-front cost, monthly/quarterly or annual maintenance costs, and volumes of service being procured over discrete blocks of time such as user counts. Costs are calculated and distributed accordingly.

Requirements Tab in Popup

The requirements tab of the material cost estimating popup has been enhanced in version 2.1 in line with the ability for non-subscription items to define discrete dates and quantities (a delivery schedule) or quantities consumed over time between start/end dates for a given quantity. In either case costs are distributed based on the set of dates and quantities for the material estimate. Based on these enhancements it is now simple to model the costs for software subscriptions, hosting/infrastructure, equipment lease or rentals, and even payment milestones for expensive procured or subcontract parts where the vendor is paid over time, with some advance payments.

WBS Cascade Menu

As well as making the WBS cascade gear menu configurable via the screen control set logic outlined in version 2 release notes, additional cascade options have been provided for the cost deferral method (explained immediately above), the funding source, the cost center and the profit center.

Project Scheduling Fixes

The project scheduling method whereby subordinate or lower level WBS, tasks and labor or material estimates are stretched or reduced to meet the new start/end dates and project duration - the one which most closely mirrors scheduling in MS-project - was fixed and adjusted to use working days instead of calendar days. An option to ‘snap’ the WBS, task, and labor/material estimate start/end dates following a reschedule to the start and end of a calendar week, or month, was also developed. Finally, gear menu options were provided at the phase level, or at any level of the WBS, to reschedule content below that node.

Display of KPI Widgets

The screen control set concept developed in version 2.0 has been further expanded in version 2.1 to allow the system administrator or implementation consultant to define key performance indicators (KPIs), tiles or widgets, across the top of the application window, just below the tab strip. These widgets are extremely configurable and can display an icon, a large-font KPI such as total cost, revenue or margin, a smaller sub-title KPI, tooltips for both and a link button to perform an update action. The best part is that these widgets can be associated with a customizable view in iPE so anything the implementation consultant can calculate in an SQL view can be displayed in a KPI widget or tile. Version 2.3 will enhance KPI tiles or widgets further to include trending information, RAG color-coding and graphical displays.

Deletion and Un-deletion

Additional objects including bill of material items, contract lines, and billing milestones are now marked for deletion and can be undeleted if the user changes their mind. At the same time checks for data integrity have been tightened up significantly, for example it is not possible to delete a phase or WBS element with estimates assigned, unless the user confirms in a new popup to delete the underlying estimates at the same time.

Phase and WBS Copy

Phase and WBS copy features have been made more robust, similar to deletion/undeletion, with any assigned estimates to the phase or WBS being copied automatically, at the same time.

Supplier Master

The supplier master app has been improved with supplier locations/sites and organization hierarchies, small business administration codes, multiple addresses, DUNS references and supplier contacts or people.

CRM Inbound API

A new API which can be called from any CRM tool such as SalesForce or MS-Dynamics has been made available and published for clients to automatically, from CRM:

- Create or update new proposals, referencing a specific opportunity ID
- Assign team members or stakeholders by role, including as named resources, and mark proposals as confidential/restricted (only team members can access)
- Assign customer information including a number of customer or partner companies working together on a single proposal
- Assign customer contacts to the proposal as external team members
- Create or update contract line items on the proposal based on service offerings defined in the CRM tool. Each contract line can import its own project template, together with cost structure/WBS and even template resource estimates for the delivery of that service. Updates to contract line pricing, service offering, ownership and pricing, are also supported
- Manage overall project and product/service delivery dates
- Delete any of the above

All of Twenty5's published APIs now adopt SAP BTP authentication tokens and have a 'method' attribute for each object which can be specified as create, update, delete or left blank.

Customer Update API

In conjunction with our CRM API we have also published an API to create or update customer records in iPE, called from CRM.

User Update APIs

A user API has been published allowing clients to automate the previously manual process of user creation, resource/resource group assignment, authorization role assignment and user termination or locking. Now clients can call this API as part of their new hire onboarding script to automate setting up access to iPE along with all the other IT systems a new hire needs to access.

Version 2.0 - January 2022

Screen Layout Controls

With version 2, Twenty5 has introduced an entirely flexible and configurable screen layout concept, allowing the system administrator and/or implementation consultant to hide, rename, change properties and move around any tab, panel or screen area, field, table, table column, menu text or button in any screen. We have introduced a concept called a 'screen control set' which is a configuration file which stores all UX element properties dynamically in a HANA table, and which is in turn selected and applied based on the app, proposal/project type and/or user job role as the app is loaded. This change required extensive modernization of our layouts across all of our applications to apply a consistent floor-plan layout for form fields (we previously had a consistent layout for table columns anyway) as well as to extend this layout concept to tables with a hierarchy (such as WBS or bill of material views) and to pivot-tables (such as the costing workbench analysis and rates summary pivot tables).

This topic is so extensive we could write a whole manual dedicated to it; actually, we did write a whole manual on it. So please take from this that you can hide, rename, or otherwise change any fields, table columns or menu options anywhere, and the best way to do that is to contact your support or implementation consultant to help you (they have the manual).

Contingency/Risk Categories

Version 2 introduces formula-based risks where the weighted cost impact is not just calculated as cost impact times probability, as with our risk register in version 1, but based on a formula. Formulae are an existing feature of iPE allowing incredibly flexible definitions or question & answer style calculation of labor hours or material or other costs, now extended to calculate contingency-based risks or risk amounts by category. For simpler projects, instead of asking the estimator to come up with a risk register from scratch, you can copy a predefined list of risk categories from your template proposal - for example project complexity, contractual-risk, schedule-risk, international working risk and so on. For each risk category you can provide the user with a simple multi-choice selection of the %, then automatically calculate the weighted value of each contingency or risk category as a preset % of a base cost. We even display tooltips or instructions next to each answer option to make it easier for the user to choose the right option. In all other regards, formula-based or contingency risks work in the same way as regular risks from a risk register, for example: response plans and mitigation task lists, heatmap classifications, reporting and overall proposal or project risk adjusted cost, revenue and margin analysis are all the same.

Risk Management as List

In version 1 you had to click on a link to create or edit each risk in a new application window or browser tab. While this is still supported, users can now edit and insert risks directly in table form within the estimate, or

proposal, as a list. Most features in the risk 'app' such as cost impact, probability, formula-based input selection mentioned above, heatmap assignment, cause, response, owner etc. are supported in the list format. The only significant feature which is not available in the list - because it is a list for each risk - is the definition of the plan or series of tasks to mitigate the risk, together with the cost of each task and the impact of each mitigation task on the overall risk's weighted cost impact.

MVEL Based Expressions

The formula concept in iPE has been enhanced considerably through the addition of MVEL-based formula rules in iPE. Now formula expressions can be written in MVEL which is a powerful, intuitive, well documented and supported rules engine/expression language. As well as adopting a well-known industry standard for formula rule definitions in iPE, MVEL allows formulae to be based on if/else expressions, on questions or input parameters which are selections from a list, and on scripted expressions with many lines or steps. For example, you can now create a true 'questionnaire' style formula asking the estimator for key information such as number of training classes, average number of attendees per class and the delivery method (web-based, self-teach, classroom, exercise, video etc.) with the MVEL expression designed to calculate training material development and delivery hours dependent not only on the number of classes and attendees per class, but also on what kind of class it is (using if statements).

To properly support MVEL-based formula expressions we have introduced formula parameters which can be checkboxes or yes/no responses as well as selections from a list. Contact your support or implementation consultant in the first instance for help designing formula questionnaires and calculation expressions.

Proposal-Specific Formula

Formulae have become so popular in iPE that end users are asking to create their own proposal-specific formula, as opposed to contacting a system administrator and asking them to create new formulae centrally. To support this request, we have introduced the concept of a proposal-specific formula (a formula which only applies to one project) as well as an easier way to create formula on the fly via a popup window while creating an estimate. It is not quite as easy as creating a formula in XL, but the most powerful feature of formulae in iPE compared to XL is that you can control formula definitions centrally and have users adopt the same formula across multiple proposals or projects, including the option for a system admin to convert a project-specific formula to a global formula for other people to use. Also note, that while formula are not automatically calculated in the correct order (like they are in XL) iPE has a ranking concept for formula calculation priority so that formulae which do not rely on other formula results as inputs, can be calculated first.

The list of possible formula to select within each estimate (labor/material/other cost) can now also be filtered, showing labor specific formula in the labor tab, material specific formula in the material tab, and so on.

Proposal-specific Tag Values

We have also introduced the option for proposal-specific tag values as well as formulae, so that tags can be defined globally or as proposal/project specific tags, and even proposal-specific tag values can be assigned to global tags. Tags can be used within formula base parameters and are available in the cost/price analysis tool.

Funds Management

Version 2 of Twenty5's intelligent pricing and estimating (iPE) introduces funds management to track internal or customer funds or purchase order (PO) amounts. The project or proposal owner can define one or more funds/customer PO's at the proposal or project header and in turn assign any labor, material etc. cost estimates to each fund, tracking the funded vs. estimated vs. actual vs. committed cost by fund, as well as the remaining balance. Funds can represent pools of money for internal capital projects, where different project segments, phases or change orders are derived from different funds, or they can represent customer pools of money such a customer purchase orders or 'colors or money' as some US Govt. agencies term funds.

Sourcing

iPE costs material such as hardware, software, fixed price services or bill of material configurations using purchase order history, vendor contracts, production order history or routings, engineering estimates, standard or moving average costs from SAP ERP or vendor rough order of magnitude cost estimates (ROMs) or vendor quotations. Integration to procurement systems such as SAP S/4HANA, Coupa or Ariba are also provided to read in vendor quotations and purchase order history for material costing purposes. However, several clients identified the need to not just read sourcing information from Coupa or Ariba, but to 'drive' sourcing in Coupa and Ariba during the proposal cost estimating stage, for example trigger vendor quotes for any material cost estimates where there is no PO history less than three years old. As a result of this request, Twenty5 developed a sourcing module within iPE which allows the material cost estimator to group together materials based on a company policy or sourcing strategy - for example by commodity code and/or fund – to define sourcing options such as vendors or quota arrangements, to schedule the milestone or target dates for sourcing and procurement activities to meet the project schedule, and to send this information to Coupa or Ariba to automatically generate a sourcing event, in turn reading back the vendor ROM/quotation pricing as material cost inputs.

To support this development, we created a new 'sourcing app' which groups together the sourcing plans for one or more than one project, allows sourcing events to be updated manually or automatically based on company policies, and then transmitted to Coupa or Ariba for online quotation purposes. iPE also calculates the receipt, purchase order transmittal, purchase order placement, sourcing completion and sourcing start target dates based on lead time offsets and transportation time matrixes

Improvements to Cost Model

The following attributes have been added to our cost model for cost and revenue reporting purposes, as well as a general tidy up of the naming conventions for each dimension, plus the ability for clients to hide and rename specific cost model dimensions based on the screen control set concept outlined above:

- Adjustment y/n
- Additional cost and revenue components (on top of direct/indirect costs) for pricing elements, inflation, tax, interest, risk and depreciation/amortization
- Optional phase or contract line
- Funding Source
- Escalation Index
- Inflation Adjusted Factor
- T&M billing rate
- Non-billable
- Similar-to Part
- Subcontract
- Value Type (actual vs. planned vs. commitment)
- Work-package WBS

The cost model in iPE now supports 65 dimensions, plus custom defined tags, and 12 measures (cost, revenue, qty, hours etc. in source, local, company and customer currencies). The order and description of each measure and dimension has been tidied up.

Labor Summary Pivot

A summary pivot table for labor planning has been developed to enable clients to plan resources at any level of detail, for example to initially plan a project by resource group and phase, WBS or milestone, and then later on to plan a project by resource and year/month or week, with the task level breakdown added at the end as the contract is being won. This has been implemented as an editable pivot-table, whereby the user can select the row basis (e.g. phase, milestone/WBS, task, resource group, department etc.) and column basis (e.g. year/month or week, or milestone, or department etc.) and then input planning values as hours, which are in turn automatically aggregated and disaggregated up and down the planning structure.

Pricing Enhancements

Several enhancements have been made to pricing within iPE including Target Margin pricing (where the margin is a percentage of the revenue), Cost-plus mark-up (where the margin is a percent of the cost), T&M and fixed fee-based pricing scenarios. Formula or outcome-based pricing will be added in the next release.

Revenue recognition has been enhanced at the same time in line with the new pricing strategies as explained below. Cost and revenue roll-up from estimate to WBS to contract line to proposal header has also been enhanced, to exclude contract lines based on the contract line item type configuration (exclude from revenue or cost flags in the contract line item type settings) as well as to exclude optional contract line items. You can now also define table views within the pricing table of the contract line item popup.

Sales Tax

Sales taxes can be automatically calculated based on tax code or rule on the sold or contract line's product or service; location where the service is being delivered or the company has a tax presence; and the appropriate sales or value-added tax rate for the tax jurisdiction. The tax jurisdiction or tax region where the

product or service is being delivered can be anything from a country or region (e.g. for EU, Australia or Canada) to a specific town/city, county or zip-code (e.g. for the US). iPE does not yet automatically update sales tax rates for all 100,000 tax jurisdictions in the US however we can purchase up to date tax rate tables on request or help clients to load their required sales tax rates and percentages in our tax table.

Billing Milestone Generation

Billing milestones can be automatically generated to fall on specific dates in each month, quarter or year, to achieve a target cashflow or to ensure positive cash or simply based on a distribution curve such as linear/equal milestone amounts by period. Billing milestones which are generated in this way can also be automatically rounded.

Configurable Bills of Material

A major development as part of version 2 of iPE are variant configurable product structures, with options and features assigned to fully define a configurable end item or cost estimation installation or assembly. For example, a car may have a make, model and series number but it is thousands of different configurations when the engine size, 2 vs. 4-wheel drive, wheels, interior materials, options and colors are all considered. The configurable bill of material in iPE works in a similar way with:

- The option to define a 'master' or 'super' bill of material (BOM) with all possible combinations of services and materials in the master. A configurable checkbox has been added to the product/service master to denote this
- Assignment of parameters or options to the end item, and to its lower-level assemblies, for example the color, size, throughput, material, finish etc.
- Selection, or filtering out, of BOM components using selection formula. Selection formula are MVEL expressions which include or select the BOM component when true, and which exclude or de-select the BOM component when false
- Quantity formula which dynamically calculate the quantity of a BOM item based on the formula expression or result
- Interdependencies between formula input parameters, with the user being able to define parameters which hide other parameters, which automatically default or set the values of other parameters, and which limit the list options available, and validate or check the users' selections. There are four separate expressions on each parameter to default, set, hide, and check the user's input on each parameter, based on a formula expression which in turn considers other parameters previously selected by the user
- Usability controls for when there are many parameters on a single installation or assembly, to control on which tab of the options and features popup the parameter appears, as well as in what order down the tab they appear
- Automatic inheritance of parameter values down the BOM structure with the option to reassign new values at lower levels of the BOM based on how they are set-up
- The ability to automatically cost the assembly, installation or any lower level make or purchased item within the indented BOM structure using parameter value or tag-specific costing and pricing, in other words to assign a price to each set or series of parameter values or options

- The ability to define hours or rate formula (as yet more expressions) which calculate the hours for assembly/installation, or cost for material/equipment, according to a user defined formula expression and the values of the parameters within that expression

The contract line can be configured, or the bill of material within the material cost estimate, depending on user preference. Parameters values or options can also be mapped to tags for reporting purposes in the cost/price analysis tool.

Improvements to Copy

Version 1 supports copying of a prior proposal or template which facilitates re-use, company best-practices and learning from prior bids and projects. Version 2 brings the following enhancements to both prior proposal and template copy:

- Ability to re-assign template proposal cost structures, and labor/material estimates to a new company, segment, site and/or department during the copy, by leaving these properties null in the template
- Rescheduling of the copied or template proposal, including its contract lines, billing milestone, cost structure/WBS and labor/material/other cost estimates, to the new proposal dates. Different scheduling methods support changes to the overall program duration, for example squashing up or stretching out the WBS, task and estimates accordingly
- Automatic update of the cost and billing rates for any labor copied from a prior proposal or template. For example, if the prior proposal or template was created two years ago, then new rates could apply to the new proposal; these rates are applied automatically into the new proposal based on the new site or department applicable
- Automatic swapping of the resource group, for labor, when there are different resource groups defined in different sites or departments, for the same resource role. For example if there is one resource group (and cost/bill rate) for consultants in Atlanta vs. another resource group (and rates) for consultants in Mexico then the resource group is automatically swapped at the same time as assigning the department from the new project to the copied-in template
- Improvements in copying objects where were missed in version 1, including copying formula parameter input values and proposal-specific currency exchange rates, and copying my team, remarks and header information such as costing sheet, labor/material price book
- Tracking what template each element of the new proposal was copied from, including for each contract line, billing milestone, WBS-task, labor, material, travel or other cost estimate. This is particularly useful when copying in multiple templates at the same time, either manually or via the CRM API which will be delivered in version 2.1, to know what lines and WBS elements came from what template

Proposal/Estimate Validation

Rules-based proposal and estimate checking can now be invoked, based on a fully configurable set of checking rules, which are in turn based on specific field values or simple SQL stored procedures, automatically during proposal or estimate save.

Advanced Search

At the same time as improving the prior proposal or template copy, we have introduced an advanced search feature using HANA's federated search. Working with your implementation consultant to configure a search 'view' in HANA, you can define the criteria, rules or conditions, weightings, facets and attributes of your search, across any tables in iPE. This advanced search is fuzzy, i.e. recognizes typo's and upper/lower case, and it has an Amazon-like user interface displaying not only the search results as a list but also a series of filters called facets, on the left side, with record counts to drill down on the search results further.

The first advanced search application has been applied to the WBS element in the iPE COST STRUCTURE tab, with sophisticated copy control to control whether to transfer the copied WBS information to the new proposal's company, segment, site or department, and other copy controls.

The second advanced search application is in the material look up within the bill of material or planned material cost estimating application. We are now working on applying advanced search options to the resource group.

Version 1.6 - April 2021

Billing Milestones

Clearer delineation of revenue or amount the company expects to receive in the company currency, vs. customer payment amount or the amount the customer expects to pay in the customer's currency. Aside from potentially being in different currencies, money paid directly by the custom to a third party such as a carrier or tax authority would be included in the difference between these two columns.

Some enhancements to how billing milestones are uploaded from XL were also delivered in this version, as well as a feature for users to create and save views of the billing milestone tab with their desired column/sort

Cost/Price Review

Cosmetic enhancements to the display of fiscal years (prefix with FY) and fiscal periods (prefix with Per) in the cost/price review tool or pivot-table. The following dimensions were also added to the cost/price review:

- Similar-to part number
- Assigned task (for estimated costs by task not just by WBS)
- Basis of estimate, control account and work-package WBS from the WBS hierarchy based on indicators in the proposal WBS tab
- Fiscal quarter

Material Master Sync

Invalid HTML characters like %, # or / can be maintained in SAP material numbers because SAPGui does not follow typical web application rules. Unfortunately, we discovered this causes downstream impacts especially when you try to open a part's material master in iPE in a new browser tab with the SAP material ID as part of the browser URL. To prevent this being an issue in future we enhanced the material master

sync to replace all these invalid HTML characters with a hyphen in the internal material ID as stored in iPE, without changing the external material ID which the user sees in the application and includes in all reports.

Record Deletion

Additional validations have been implemented before allowing users to delete a basis of estimate (namely: there should be no costs within that BOE, not be assigned to a proposal line item). In addition, instead of purging bill of material, consolidated material, labor, travel and other direct cost estimates when they are deleted, these records are now 'marked as deleted' so they can be undeleted again, if required.

Security Enhancements

A number of user authorization and security enhancements were built, as follows:

- Linking access to estimates within a proposal based on the access-rules for that proposal, in other words stopping people who are not authorized to see the proposal from seeing its estimates
- Mapping of export controlled or ITAR restricted proposal data by adding a field to the proposal for export controlled data and a checkbox in the user profile for 'US person'. In essence, only US persons can then see proposal data which is subject to US/ITAR control
- Broadening the scope of a user's assigned companies to allow assignment of a site, company or segment and user can then access all proposals (and their estimates) within that site, company or segment. For proposals this includes any site, company or segment listed in the SETUP tab under "other departments involved" whereas for an estimate it applies to the proposal's primary company/site and the basis of estimate primary company/site only

Fixing an earlier issue whereby clicking on a link which opens a specific proposal or estimate in a new browser tab skipped the authorization check.

Site/Department

Fixes to the site or location of make part labor from a routing as compared to the site or department in the bill of material item, to keep them in sync. User can still elect to include labor from another site in a make part cost estimate (make part labor list) if the estimating source is 'discrete planning'.

Table/Pivot Views

Minor fixes to saving table, pivot table and tree column (expanding row column) views for columns, sort and filters based on user preferences. Fixes to how the bill of material and WBS elements nodes are automatically numbers because of these two tree-column sorts.

Version 1.5 - January 2021

Additional Cost/Price Review Data Elements

The following measures (report on), and dimensions (report-by), were added to the cost/price review toolset or pivot table:

- Activity type (from labor costs)
- Contract line item type (for revenue display)
- Cost/revenue display option: display of cost, pricing revenue, both cost and revenue, or cost and equivalent T&M revenue (labor hours x billing rates, unadjusted with discounts or surcharges) only
- Cost – upper and lower limits of cost based on confidence or regression analysis calculations. To use this, refer to Twenty5 to help you set up regression analysis based formulae in iPE
- Revenue in customer, company or price list currency, based on the line item pricing detail in the proposal line item popup and revenue recognition rules outlined below (see Revenue Recognition Methods)
- Risk – weighted risk and opportunity impacts (cost or revenue impact x probability) can now be reported on in the cost/price review tool, allowing you to report on risk adjusted costs and margins
- Supplier country which supplements the SBA code for small business administration spend data reporting

BOM Cascade

You can now cascade data down the BOM hierarchy based on only what you can see in the BOM due to filters. For example, if you filter only to view make parts you can then cascade something such as complexity to the lower-level nodes which are make parts, skipping purchased parts.

BOM Cost Roll-up

A fix was applied to the BOM cost roll-up for unit of measure conversions. Now you can have a different base unit of measure, bill of material unit of measure and a third unit of measure on the historical purchase orders used for cost analysis, with conversions between all three at the appropriate times in the costing, consolidation and cost roll-up.

Comments Tab

The comments tab was completely reworked with a more modern “Skype-like” user interface showing speech bubbles for historical comments. Users now add or edit comments in a text box at the bottom of the screen as opposed to the top. Users now have the option to edit or delete their own comments, but they cannot edit or delete comments posted by someone else.

Consolidated Material Popup

The popup which comes when reviewing consolidated material costs showing the labor cost/historical production orders (for make parts) or purchase order history (for buy parts) has been enhanced, with a

consistent information in the top section of the popup across most tabs and will enhancements to the purchase order history display including:

- Visual indication (by plot colors) of which historical PO was selected as the source unit cost reference, which other historical PO's are for the same vendor, and which historical PO's are from other vendors
- Fixes to the unit of measure conversions from historical POs in different units to the product's base unit or bill of material unit
- Option to select multiple historical POs and compute an average cost across this subset. Note: in this case the first PO in the set is stored as the reference purchase order
- Fixes to the calculation of set-up times (based on new attribute for the number of set-ups in a make part cost estimate), realization factor (the routing efficiency of a given work-center) and complexity (the product complexity or overall cost factor)

Copying a BOE

As well as copying from a template or prior proposal in the proposal SET-UP tab, choosing what to copy from the checkbox list, you can now copy tasks, labor estimates, BOMs, travel estimates and other direct cost estimates from the basis of estimate WORK tab. To do this, select the option to copy from a template or previous basis of estimate or BOE, search for your reference BOE, and select which items (tasks, labor, material, travel etc.) to copy by checking the appropriate boxes. You can include more than one template into the same BOE.

When you copy an estimate with material costs, for example to copy a "price list" of part number cost estimates based on previous costing runs, the department or company often changes because you are copying from a generic template into a proposal or BOE delivered by one of your specific companies. Re-costing the new estimate used to result in any user adjusted retained costs in the template estimates being reset. This is because the concept of retaining costs – or freezing the previous estimates - only works when the new costed part number/similar to, department or site, make/buy indicator, estimating method and option/non-option combination match the previously retained estimate; in other words costs are not "retained" across different departments or sites. This makes sense when you consider that material cost estimating is generally site-specific, but it is not helpful if you have a template which you want to work in any department or site.

To avoid this and to ensure that template or retained material costs remain frozen, clear the company and department columns in your template BOE material cost estimates. Now when this template is included in a real BOE and cost consolidated BOM is re-run for all items, the template costs which were retained will remain retained even though the company and/or department were updated.

Costing from Legacy Purchase Orders

Tables were added for clients to load legacy (pre-SAP) purchase order history and consider this data for purchased part costing in addition to the SAP purchase orders.

Costing Workbench Rates Review

A new tab was created in the cost/price review tool called RATES to display the labor cost and billing rates used in your proposal for each resource group or labor resource category or role. These rates are displayed on a fiscal year basis, though you do not have to maintain new rates for each fiscal year you can select any valid-from date. Proposal-specific labor rates are shown in bold font. This tool allows you to quickly check that all the labor resources used in your proposal are picking up the correct cost and billing rate (with billing rates being applicable to T&M and LOE based contract proposals).

You can also edit or maintain proposal-specific billing rates, if you are authorized to open the cost/price review tool in "edit" mode and your proposal has a price-book set-up for billing rates, by simply clicking on any of the billing rates in a given resource group and fiscal year combination and changing the rate. The rate is immediately updated but recalculation of the cost/price model and reloading the screen show to show the impact of the new cost or billing rates including where it is included in formula or indirect cost burdens, takes a couple of minutes.

Cross-Plant Estimating

As opposed to purchased part estimating which ignores site or department/plant and make-part estimating which only looked in the site or dept/plant of the BOM component, you can now define which estimating sources should be plant or site-specific vs. cross-plant in your configuration. For example, you can limit purchase order history to a specific plant, or you can instruct the system to search for routings or production order history across all plants.

Unlike purchase order estimating, which selects the best-fit historical purchase from one or all plants order based on age and quantity variance - make part estimating still only considers data from one plant at the time. When you activate cross-plant estimating for make parts, routings or production orders are first checked to see if they exist for the plant or site of the BOM component – in which case the history for that specific plant or site is adopted. If no routing or production order history can be found in the BOM component's plant or site, then the system searches across all plants, adopting data from the single plant with the latest or most recent production order or routing history.

Estimate List – Costs

The cost columns in the list of estimates now display the rolled-up labor, material, travel, other direct and indirect costs, including costs from estimates assigned to the WBS elements within each basis of estimate (BOE), as opposed to only those costs assigned directly to the BOE WBS element.

Home Page

You may have noticed our new home page, which comes up whenever you start the iPE application without a default start activity. Much nicer to look at as compared to a blue screen.

Labor Estimates

Billing rates can be defined in the price-book application e.g. for time and materials based proposals. We have added columns to the labor estimate for the billing rate and equivalent T&M revenue (hours x billing rate) in both company and customer currency to give you a quick idea of the T&M revenue as you plan your resources in a proposal. Remember that billing rates in the labor estimate are valid for the resource start date, and do not vary by fiscal year within a single resource estimate which crosses multiple fiscal years. Cost and billing rates which change by fiscal year are applied in iPE's cost model in the cost/price review tool.

You can also organize the labor estimate rows in your own order using a new "seq" column, and you renumber this column based on the current column sorts. You can also automatically add one resource per task to your labor estimate for faster data input.

Labor Planning – Dragging and Mass-Copying Cell Values

Like XL, you can now drag cell values down e.g. to copy down the start or end date in a series of labor resource estimates. You can also click and drag from the middle of the cell to highlight multiple cells and then either press the delete button (to delete all highlighted cells), cut/copy or paste. Values in multiple cells can be pasted. You can also download and upload labor estimates from XL itself.

P6 Export for Hours

Added WBS reference to the task-resource download for importing back to Primavera P6, as well as task dates in user-fields, because Primavera P6 schedules its own dates and users wish to see the dates from iPE in Primavera without rescheduling the entire project.

Pocket vs. Net Invoice Price

There are fundamentally two kinds of revenue on each proposal line item: the revenue which impacts margin or "pocket price" (which is often in the internal company currency) and the amount paid by the customer inclusive of non-margin impact elements such as sales tax or "net invoice price" (which is often in the customer's currency). The pricing screen for each line item and the billing milestones have been refined to identify each revenue element from the configurable pricing table more clearly, and to better cascade or roll-up costs, prices and revenues from line item to phase and/or to proposal header.

Proposal Dates

Proposal line item delivery dates default from the program period of performance, or the phase assigned to the line item. You can also setup automatic defaults for the proposal start date - such as start today for a spares quotation for example - and duration, in months. Line items added to the proposal will automatically default the manufacturing completion date or delivery due date as today + lead time if it falls within the program or assigned phase period of performance.

Proposal Specific Rates

You can now maintain proposal or customer-specific costing and billing rates in either the Resource Group set-up application (RATES tab) or in the Price Book application. We also have an easy way to review and edit proposal-specific rates in the cost/price review RATES tab outlined below.

Proposal and/or customer-specific costing and billing rates are used before company-wide rates, with the option to maintain a specific price-book in the proposal PRICING and ADVANCED tabs. Proposal-specific rates must be created in a price-book. As with company-wide rates, the most recent proposal or customer-specific price-book costing or billing rate is used which is valid for the cost/price review month in question

Retained Cost

You can now mark or unmark multiple consolidated material costs for retaining costs in a future costing run at once, instead of checking the retained cost box one row at a time. Retaining cost means that the historical reference and unit cost (e.g. PO, routing etc.) is carried forward but any changes in the BOM quantity are still re-applied.

Revenue Recognition Methods

You can now report on revenue, as opposed to cashflow, in the cost/price review tool or pivot table. Revenue can be reported over time, by line item (CLIN) or phase, by pricing element (profit, award/incentive fees, discounts, surcharges, freight, tax etc.), based on risk, by end item part number and by proposal version. You can also more easily extract revenue information into views to support external reports such as in SAP Analytics Cloud or Tableau.

Revenue is calculated from the proposal line item prices, as opposed to cashflow which is computed from the billing or payment milestones. These revenue recognition rules are available in proposal-type settings:

- Based on delivery dates with proposal line item revenues time-phased according to the manufacturing completion or delivery due dates, or the delivery schedule which can be maintained within a priced line item. This is accrual-based revenue recognition
- Based on when labor is planned to be incurred or delivered, at the equivalent T&M billing rates, for labor-based line items. Labor price discounts and surcharges are still considered so the line item revenue is ‘spread’ over time according to the equivalent T&M revenue profile
- Based on the planned billing milestone payments, or cash-based revenue recognition
- Based on the cost profile with the total line item revenue distributed over time in the same way the costs are distributed. This models percent complete or long term project-based revenue recognition
- Based on the estimated sales order creation date, or backlog, which is in turn based on the “award date” field in the proposal, to represent sales based revenue recognition

Revenue risks and opportunities can be included or excluded from revenue reporting in the cost/price review tool with revenues risk/opportunity calculated as impact x probability (weighted impact) and time-phased according to the risk from/to dates.

Risk Maintenance

Some enhancements to risk set-up and maintenance, especially the RESPONSE tab, include:

- A configurable risk policy description
- Fixes to how weighted and target weighted risk impacts are calculated based on direct input of target impact vs. maintaining a risk mitigation plan with weighted probability and cost impact by mitigation task
- As mitigation plan tasks are completed the current risk weighted impact is recalibrated to account for the impact of completed mitigation plan tasks
- Validation to check if the user is entering risk from/to dates outside the assigned WBS planned dates, or is adjusting the current impact to a value which is higher than the target (after mitigation) weighted impact

Risk Reserve

Risk reserve, or the sum of the weighted cost impact of all cost risks (minus the weighted sum of all cost reducing opportunities) has been added to the SAP baseline interface. You can assign a cost element or GL account for risk reserve in your proposal, and transmit the weighted cost impact to this risk reserve account, with or without indirect cost burdening rules applies in iPE, as part of the SAP project/WBS cost baseline interface. You can also select one or more WBS elements within your proposal to assign risk reserve to once it reaches SAP.

Security

The authorization concept in iPE was enhanced significantly in this version so that now users who have "company" level access can only access proposals, projects, risks and estimates where they are assigned to:

- The main or additional companies in the proposal
- A segment or group of companies in the proposal
- The main proposal company or WBS delivery company for access to the estimating app
- Where they are the owner (original author, owner or current workflow owner) of a document even if it is not assigned to their company or segment

In addition, you can restrict access to the proposal and its risks and estimates based on checking the box "only people below can access" in the TEAM tab of the proposal and restrict access to the proposal, its risks and estimates based on ITAR conditions so that only US-persons can access ITAR related proposal data for example. These two authorization concepts take priority over the company or "own" access level concepts, so that even if the proposal etc. is in your company you will not be able to access it if it is restricted to specific team members, or if it is restricted based on ITAR controls.

Tooltips

A lot of field and table column explanations or tooltips were added. Refer to your Twenty5 implementation consultant for a data dictionary listing all the field explanations in iPE. Some data labels were tweaked for consistency across applications.

Upload Billing Milestones from XL

The XL template for uploading billing milestones has been enhanced to create new or update existing billing milestones based on the milestone sequence number, including adjustment of either amount or %, date, description and the assigned proposal line item, with better error handling of invalid XL data being uploaded.

Upload BOM from XL

Several enhancements to the BOM upload XL template include:

1. Instructions on what each column means, and which are mandatory
2. Option to automatically create new product/service masters (material master data) from the BOM XL upload by simply specifying attributes in the XL sheet such as product type or standard cost
3. Fixes to created by/on in BOM components uploaded from XL
4. Inheriting BOM data not specified in the XL sheet from parent nodes or from the product/service master similar to when adding BOM components through the user interface. The supply site or plant can be specified in the XL upload, inherited from the product master, or inherited from the BOM parent node
5. You can upload make parts from XL and automatically import their BOMs from your SAP or PLM tool as part of the upload by noting “import” in the action column of the upload sheet
6. The system now automatically checks if a product/service master was previously deleted for an uploaded BOM component
7. Capturing uploaded BOM items from XL in the BOM change log (the basis for ‘net change’ cost consolidation)
8. Consolidating all the upload errors into a single dialog or email before terminating the upload, so that the user can review and fix all the errors at once instead of one issue at a time

Upload Proposal Line Items from XL

The XL template for uploading proposal line items has been enhanced to create new or update existing proposal priced line items including processing of part number, type, description and in exception cases the unit price. In general, line item costs and prices are calculated within iPE and cannot be uploaded from XL. End items which are bills of material or manufactured in-house parts can be uploaded from XL but the “cost BOM” indicator to import the SAP or PLM BOM must be checked by the user after the upload.

Upload WBS from XL

The XL template for uploading WBS elements and tasks has been enhanced to edit/create WBS nodes based the WBS number, to build out the parent-child structure based on the numbering convention (similar to the BOM upload) and to validate dates (calculating duration). WBS costs and calculated columns are not uploaded.

User Profile

Some fixes to user preferences including date and number formats, display of last access and checking for duplicate emails/userIDs/badge #'s.

WBS Added Data

Columns for level, duration and design-to-cost (DTC) rolled-up hours were added to the WBS table in proposal and cost/price review apps.

WBS Drag & Drop

Dragging and dropping a task or WBS within the hierarchy is now easier and more robust include automatic transferal of estimates between BOE's when a WBS or task is dragged to another BOE, re-assignment of the WBS in each estimate when a task is dragged to another WBS, and checking that dragging and dropping a WBS does not result in structural errors such as a BOE within a BOE or costs which are no longer in a BOE.

WBS Validation

WBS settings are now validated in real time including errors if you put a BOE above a BOE, and work-package above a work-package, a control account above a control account, a work-package above a control account, and so on.

Version 1.4 - September 2020

BOM Performance

Several enhancements have been implemented to BOM performance to cope with bills of materials for material estimates in excess of 50,000 parts, including:

- Separation of BOM and consolidated material views into two tabs to avoid users from loading both datasets into local memory twice by opening separate browser tabs for BOM vs. consolidated
- Processing of the full BOM on the server instead of loading the entire indented BOM structure down to the user's browser for the purposes of searching, filtering, and downloading to Excel. Now search, filter, and Excel download are all managed in the server, hidden away from the user, and results are returned to the user just as before. It should be noted that server calls are now made anytime the user expands a BOM node, resulting in a delay of up to half a second. This is offset by much faster initial BOM load times and is consistent with how other web-applications such as Google Drive handles large data lists

BOM Usability

The indentured bill of material (BOM) item details and quick-create product or service popups were both optimized and combined into a single popup for consistency and ease of use. At the same time, the import

BOM popup and the “make similar to” popup (which imports the similar-to part’s BOM) were optimized and combined into a single popup. As you review and edit the proposal bill of material you can add new items - including the creation of material master records and marking items as similar-to known products with cost history, and complexity. The BOM application context menu (gear menu) has also been cleaned up.

Consolidated Material Buy Part Popup Improvements

The popup in the consolidated material list is still vital for reviewing the different purchasing sources. Some usability improvements include:

- Common header fields in all tabs with similar-to p/n, supply site, estimating source, and the option to retain costs
- Color coding to indicate which historical PO’s in the chart come from the same vendor as the selected PO vs. from other vendors
- The option to modify the selected PO as the source from either the chart, by clicking on a bubble, or the list - by row selection
- The option to select more than one PO in the list and compute the average cost of all selected PO’s as the material adjusted unit cost. Note: if you do this then the material proposal “source document information”, such as source document reference, relate to the first selected PO

Consolidated Material Make Part Popup Improvements

The popup in the consolidated material list is still vital for editing the operation-by-operation labor cost from the SAP routing or production order history. Some usability improvements to this popup include:

- Common header fields in all tabs with similar-to p/n, supply site, estimating source and the option to retain costs. Display of total set-up and run (processing) hours in the header
- Realization factor (or efficiency factor) can now be edited in both the labor cost table, for individual operations, or above the labor cost table, which impacts all operations equally
- Addition of learning curve factor to the labor cost table
- The option to cost make parts based on standard cost, which means that labor costs are not computed on an operation-by-operation basis since there was no routing or production order history. Instead, such make parts are costed in a similar way to buy parts, with the standard cost x requirement quantity being estimated to the requirement WBS and product’s cost element

Consolidated Material Performance

In the same way as the bill of material (BOM) mentioned above, the consolidated material list is now also managed on the server, with only the records which are visible to the user plus 1-2 hidden pages being loaded into the user’s browser. This improves responsiveness and reduces the volume of network data traffic and browser memory utilization. It is especially important when bidding for large complex assemblies with 25,000 or more materials since you get around 150 columns of data per material.

Search, filter, and downloading of the consolidated material list to Excel are now managed in the server with the results returned to the user as before. Scrolling down the list more than 2 pages will result in up to one-

second delay as more data is loaded from the server, much like other web-apps which manage large datasets like Google Drive.

External BOMs

External bills of material (BOMs) are managed in an external system such as product life-cycle mgt. (PLM) or enterprise resource planning (ERP) tools. When you import a BOM from ERP or PLM you have the option to import the BOM as "external" which means you can only edit certain estimating attributes – such as supply site, lead time or estimating method – with engineering attributes such as part number and BOM component quantity being locked down and only editable in the external BOM application. In this way, if you prefer engineering to maintain proposal-specific BOMs in your PLM/ERP system, or you are estimating a new product whose bill of material is being actively developed in parallel to the material cost estimate, you can lock the BOM structure for engineering to maintain while still allowing material cost estimators to edit the costing parameters in iPE.

While you can re-import (update) an external BOM to reflect the latest configuration in PLM/ERP at any time, automatic scheduled or real-time updates of the iPE proposal BOM from your PLM or ERP system are set-up as part of the implementation, as are PLM-system specific interfaces. We will either build an interface mapping and Java API for your PLM tool as part of the implementation or provide an SAP HANA database table (schema/fields) for you to synchronize your PLM BOMs into.

Formula Setup

The formula and parameter set-up apps in iPE were rebuilt as a single combined application to support regression analysis and to clean up the user interface. Now users can:

- Create formula and assign or create new parameters at the same time
- Edit base parameter criteria, e.g. what source costs or hours to include in the base, from the formula setup screen
- Edit user input parameter values, such as hours per drawing, based on the defined parameter scope e.g. by company or by fiscal year, from the formula set-up screen. Note that when parameters are shared between two different formulae, changes made to a parameter in one formula will affect the other formula
- Apply a "training data set" to a regression formula and invoke SAP's predictive analytics library (PAL) to analyze this data and compute the relationship or formula linking the user's selected inputs - such as the number of drawings - with the user's selected outputs - such as total hours to develop the drawings. In this way, rather than manually entering the "hours per drawing" based on the user's expertise, you can use the power of machine learning to calculate the hours per drawing from your labor history
- Tag formulae with customer-defined attributes for classification and searching purposes
- See the estimates where the formula has been used to know the impact of changes to an existing formula

Material Costing Performance

Consolidation and costing of the bill of material, or generation of the consolidated material list, is now 3-4 times faster than it was through various code optimization techniques. There is a greater emphasis on net change which runs extremely fast, in just 1-2 minutes - with all changes that impact cost whether to the BOM or the consolidated list - captured in the “net change log”.

Material Costing Strategy

A new concept which fits below estimating method (e.g. “purchased part estimating”) and source (e.g. “purchase order”) for material costing is the “costing strategy” which refers to specific source documents such as purchase orders which fit a particular strategy e.g.:

- “Best Fit” – the highest confidence PO based on date/qty
- “Latest” – the most recent PO regardless of qty variance
- “Closest Qty” – the PO with the closest qty to the required qty

Using this concept, the material cost estimator can now see the best fit, closest quantity, and latest purchase order source documents all from the consolidated material list, and they can edit the source for buy parts directly from the list without even opening the popup.

Other Consolidated Material List Improvements

Feedback from material costing users indicated that opening a popup to make changes to the source, estimating strategy and unit cost was time-consuming so we have enhanced the consolidated material list (material cost estimates) with columns for:

- Selection of other source documents based on meeting specific strategies, such as latest or closest quantity, directly from the list
- Editing of inflation and quantity adjustment factors from the list, as well as the option to edit the adjusted unit cost directly
- Marking individual materials to “retain cost in future costing runs” or not, including the option for mass selection
- Additional columns for display of similar-to material, lot-size, number of set-ups (for make parts), optional proposal phase or line item, number of source documents found, standard deviation of the source document unit costs, latest and closest quantity sources, setup and run time hours for make parts
- Color coding of the confidence column based on the combination of confidence threshold and unit cost or part value as follows:
    - Green if confidence is above and total cost is below thresholds configured in the estimating method
    - Amber if confidence is below or cost is above the green threshold and at the same time it is not red
    - Red if confidence is below and total cost is above thresholds configured in the estimating method
    - We deliver green thresholds for confidence above 50% on parts below $100, and red below 50% confidence for parts costing $5000 or more

- Tag values - or custom fields the user adds to a proposal which cascade to the proposal WBS and in turn to detailed estimating records - can now be edited directly from the consolidated list

Pricing

Option to price proposal line items based on:

- Price-book look-up across multiple catalogs based on part number, customer or proposal-specific hardware or service prices
- T&M billing or labor pricing rates for time & materials. Fixed price proposals with information displays of total labor cost and total equivalent T&M revenue at proposal line item level
- Cost-plus a negotiated margin or fee – award or fixed fee and incentive or variable fees. We already support proposal-specific indirect costing or burden rates in iPE
- Application of discounts, taxes, shipping, freight, or other discounts and surcharges in either $ or % formats
- Volume-based price-breaks as well as prices which vary over time

Part of this enhancement includes a new application to maintain price-books, for labor and material costing and pricing rates based on various criteria such as date, quantity, customer, vendor, proposal, part-number, or labor pool.

The pricing display in our proposal line item popup has also been enhanced to display a configurable set of pricing elements with sub-totals, instead of fixed rows for gross +/- discount/surcharge + shipping + tax + net price. You can now configure your own pricing table or conditions based on cost, T&M, list, discounts, surcharges, tax, rebates, and royalty or commission payments.

Proposal Dates

Option based on proposal type configuration to default the program start date as “immediate” e.g. for spares quotations. The option also to default the program period of performance end date as start + ‘x’ calendar months.

Then in the proposal line item tab we now automatically default the line item manufacturing completion (or ready for delivery) date to the proposal start date + lead time offset for the material or hardware associated with the line item, if this date falls within the proposal or phase’s period of performance. As a reminder, the line item completion date is used via lead-time offsets down the bill of the material to determine the material cost profile for cash-flow purposes.

Remarks

Visual indication if remarks have been entered, downloading of remark text in full to Excel when lists or tables are downloaded, and the option to filter lists based on whether remarks have been input or not.

Requirements Management

Limits to editing proposal requirements in iPE when managed in an external system such as DOORS.

Resource Planning by Period

For professional services, we have enhanced our labor estimating application to support planning by period. In addition to our pre-existing feature - whereby total labor hours or full-time equivalent resources can be "spread" according to a pre-set distribution curve between user input start/end dates – we now support manual planning by period in a grid or table with one row for each resource and one column for each period. Just like Excel, only it is fully integrated with the iPE application supporting workflow, multi-currency, escalation, time-dependent labor rates, parametric based estimation, estimation based on actual history, burdened cost calculation, and more.

Rather than limiting you to a single planning-mode, we support:

- The planning periods can be monthly or weekly
- Effort can be planned in hours, work-days or full-time equivalents (FTE)

Period durations, i.e. the basis of converting FTE to work efforts, are calculated based on calendars and work shift patterns which can be assigned to sites, companies, departments, or individual resource groups. Holidays are considered, so for example January 2021 which is 21 work-days excluding weekends will actually be 20 days in duration because Jan 1st is a holiday. You can adjust the non-working dates or holidays in your calendars to create calendar month work-durations however you normally plan, e.g. for 20 days each month just add non-working dates as needed to each month of your calendar during system implementation.

Just as we already do for labor estimates distributed based on a curve, the labor estimates which are manually planned by month or week based on any of the six scenarios listed above are priced and costed according to the labor rates effective at the start of each calendar month, so the rate for a single resource might change during the course of their work plan. We also keep track of the estimated effort by month or week in a separate table to support resource utilization and capacity planning reports. Finally, we allow rapid switching back and forth between distributed effort vs. manual planning modes, rapid copying of estimates, and options to spread and therefore eliminate the variance between manual planning by period and the total effort for a given resource.

Security Access

Option to define authorization access to a group of companies or segment vs. access to documents in all companies or a single company. Option to limit access to a document such as a confidential or secret proposal to only specific persons listed in the MY TEAM proposal tab.

Similar-to Parts

Previously, to mark a bill of material component as similar to another part with cost history you would enter the similar to material as the part number, the complexity factor, and the description of the new part in the text. Now you have the option to create a unique part number for the new part, with the estimated material and similar to material numbers in two separate fields. While you still have the option to maintain similar-to

parts as a text in cases where engineering has not assigned a part number for the new part, it is recommended to create a new material master for the similar to part for reporting consistency. You can also create the new part's material master directly from the BOM view in iPE with only three user inputs required.

Sweep Analysis

When time passes between the proposal submission and contract award date the US Govt. typically requires a new "sweep analysis" to see if any new purchase orders that have been created since the proposal was submitted might cause the estimated material cost to reduce. A new proposal version allows the material estimator to re-cost based on recent purchase orders and then to analyze variances between the two versions to understand where new purchase order prices negatively impact cost. If necessary, a third version with retain cost set for all but the handful of impacted materials can be used to submit a revised cost proposal to the US Govt. If contract award date is populated in the proposal Due By tab, only purchase orders up to this date are considered.

Upload BOM from MS Excel

As we already support for proposal line items, WBS elements, requirements, billing plans and risks, users can now upload bills of material (indentured product configurations) from Excel using a specific file format. Proposal BOM nodes are added, deleted or updated based on the combination of node number and an action column, with new materials created automatically from the BOM upload Excel file if they do not already exist. To access the upload template, click on the BOM table toolbar button for upload and select "download a template" in the popup.

Usability

Option to start automatically with the user's last activity from last log-on.

User Experience

Some improvements to the overall user experience including a 30% reduction in header/toolbar height allowing more space for lists, and a search box in the top right corner, which searches the current app. Client logos are now from a URL.

Version 1.3 - June 2020

Consolidated Material Buy Part Popup Improvements

Some improvements to the popup for material cost, for purchased materials include:

- The option to show historical purchase orders (PO's) based on unit or actual cost of each historical PO, vs. adjusted unit cost which is actual PO unit cost x inflation adjustment factor x quantity adjustment factor, for each historical PO

- Fixes to calculation of the inflation adjustment factor (IAF) from changes to the source document date including month-by-month calculation of the inflation factor, pro-rated from the annual inflation based on banking industry best practices, and a consistent approach to calculating the IAF in both the popup and the background costing procedure

Consolidated Material List WBS

Some improvements to the consolidated material list include:

- Displaying the WBS which led to a specific material cost in the consolidated material list within our material estimating application, together with an option to filter the list on this WBS. Because we 'consolidate' multiple material requirements for the same part number from different instances within the proposal BOM, one single consolidated material cost could be based on multiple different proposal BOM requirements, each with its own WBS element assigned. For this reason, we currently display and filter on the first BOM requirement WBS in the consolidated material list. To see each individual BOM requirements and their associated WBS, open the popup and click on the proposal requirements tab
- Add commodity code (material group from SAP) to the consolidated material list, as well to the SAP material interface
- Option to search through the consolidated material list

Field Help

Tooltips – or little speech bubbles that appear on mouse-over with helpful field explanations – were added to all our screens covering fields and table columns across our entire application where further explanation was warranted. This is in addition to our end user help docs.

Filtering on 1.1

Many of our applications allow filtering based on the WBS number which follows the convention 1.2.3 for each level in the program WBS. Our UX framework (Sencha Classic) and JavaScript treats a dot as a field/value separator so entering it e.g. "1.2" into the filter confuses the system. This has now been fixed so you can search for WBS elements starting with 1.2.

Labor Groups

A new application for admin. maintenance of labor or resource groups was delivered in this version including features to:

- Map labor resource groups in iPE to SAP activity type/cost center/work center combinations and to Primavera P6 resources
- Map manufacturing resources (e.g. SAP work-centers) to costing resource groups (e.g. SAP cost-centers) to allow your company to estimate costs and maintain rates at a summary or costing resource group level vs. having to maintain rates for every individual SAP work-center

- Edit labor rates by fiscal year or other date-periods with the option to calculate future-year rates based on % uplifts
- Edit realization factors which are in turn copied into make part labor estimates and applied to run-times from routing standards or production order history

Live Model Download

A fix was applied to downloading our cost/price review report to Excel as a proposal "Live Model" for labor costs with no burdens or indirect cost rates being applied.

Material Cost Distribution based on a Curve

Material costing, or the process of consolidating the bill of material (BOM) by part number/option/estimating method/site and then costing each part based on purchase order, production order or routing history, uses a unique "lead time offset" approach to time-phasing the material cost. This means that material costs will be incurred 'x' days prior to the date when the next higher assembly costs are incurred, where 'x' is the lead time which defaults from the SAP material master MRP view. This rule is applied even when consolidation or economic lot-sizing such as fixed or time-phased results in a single material make/buy supply proposal across multiple distinct BOM requirements. The cost of each BOM requirement will be incurred based on that BOM's aggregate lead time offset from the end item's manufacturing completion date in the proposal line item tab.

We now provide the option, for specifically marked part numbers, to cost materials based on a distribution curve maintained in the basis of estimate work breakdown structure element or BOE WBS. Rather than spreading the cost of each widget, nut or bolt across perhaps 60 months of the BOE WBS delivery period of performance, we re-assign material proposals from a cashflow perspective to available calendar months based on the best-fit of the overall material cost profile vs. whatever distribution curve has been set in the BOE WBS. In this way the combined total material cost for all components where cost distribution is based on a curve will closely match the BOE WBS' distribution curve and period of performance.

We do not consider routing lead times when costing make parts - only the SAP MRP basic date lead time offsets - because routing lead times are typically less than one month which is the granularity of our cost model.

Product/Service

Products or services are normally interfaced from SAP's material master, with the option for estimators to create ad-hoc estimating materials or services, or to edit the estimating parameters which defaulted from SAP, in the iPE application directly. Some improvements to the product / service master application in iPE include:

- Option to cost or price materials based on a "price-book" or catalog, allowing more than one cost or price for a part number
- Option to input dimensionless unit of measure conversion factors directly into the product master in iPE, such as "box" to "carton"

- Hiding travel-only estimating attributes, such as how to calculate the travel expense quantity per trip, for non-travel material items
- Layout improvements especially for make/buy planning and estimating properties

Project Baseline

Our interface which creates a project estimating baseline based on the planned proposal cost profile was enhanced to allow editing of WBS master attributes such as the control account and work-package indicators from iPE to SAP, as well as some cleaning up of the baseline log menu with improved display of previous job run times and status.

Proposal Line Item Copy

You can now copy proposal line items. You must assign a BOE-WBS and material costing WBS and check the “cost BOM” flag to re-import the SAP or proposal-specific bill of material if the copied item is an assembly.

Running Cost Consolidated BOM

The option to run cost consolidated BOM from the proposal was removed since material cost estimators have this responsibility, not the proposal mgt. team. Always run cost consolidated BOM from the estimating application. Users are now also prevented from running cost consolidated BOM and roll-up BOM unit cost on the same BOE WBS at the same time.

SAP BOM Import

Some enhancements to the SAP BOM import comprise:

- Ability to define a minimum or “as required” quantity threshold in the SAP BOM view
- Detect SAP alternative item groups and multiply the imported BOM component quantity by the alternative’s planned % in SAP
- Better management of BOM changes made with reference to an Engineering Change in SAP, picking up the latest configuration
- Enhancements to how the supply site is processed for products procured from another site in the company, based on SAP’s inter-plant special procurement key concept. We now check for BOMs in the product’s supply site, then we check for group-level BOMs defined across all sites or SAP plant codes
- Organizing imported SAP BOM items in the same sequence in iPE as they were in SAP, namely in SAP BOM item number sequence

Stability

We now set background jobs as terminated if the server is re-started, to permit graceful job restarts or re-runs after server re-starts. At the same time, we made numerous fixes to transaction deadlocks, a situation where SAP HANA's database gets all confused and goes to sleep for a few minutes because the same record is being updated concurrently by two different users.

Top N Reporting

To support the requirement for reporting on materials which make up the top 80% or top 20% of material cost we now track, in descending order of total cost in company currency, the percentile on which each material make/buy proposal falls. For example, the most expensive material will be 1% of top cost, and if that single material makes up 12% of the total material budget for all purchased parts in the entire BOE, then the next most expensive material will fall on the 13% percentile. This makes reporting of the "top n%" of material costs easy.

Users

iPE's users are managed in our user database with single sign-on integration to SAML 2.0 tools such as OKTA. A new application was rolled out with version 1.3 to edit:

- User attributes such as contact information (email, name etc.)
- User preferences for each user including date/number formats and language
- Authorization roles to control iPE menu access rights.

Version 1.2 - February 2020

Confidence Roll-up

Confidence is calculated for labor estimates based on the estimating method (e.g. level of effort, imported resource plan, parametric or based on actual performance history) and for materials based on the age and quantity variance of the "best-fit" source document such as the purchase order or routing. Confidence is now rolled-up from each estimate to the WBS, and up the WBS hierarchy to the proposal level. As confidence is aggregated or rolled up each estimate's confidence is weighted based on the cost of each estimate in your company's currency. Users also have the option to select a manual confidence "5-star score", in the same way as you give feedback on smart-phone apps, at WBS element level. The single-user input confidence score (1-5) and system-generated score (as a %) can co-exist, though the "5-star" scores can also be derived from the system calculated % if you prefer, based on a configurable rating scale.

Costing based on Production Order History

Up until now make parts were costed based on SAP routing labor standards. We now provide a standard API for costing based on production order history, with a preconfigured estimating method for costing based on routings and then production orders, if the routing standards were not found. Fundamentally we average the hours, by work-center, across the range of production orders with options to:

- Define in configuration of the estimating method how far back to scan in terms of either number of orders or how far back in time
- Exclude or include zero-hour production orders, i.e. production orders in SAP with no labor confirmations
- Select which standard values (e.g. set-up, processing, machining etc.) should be included in historical production order hours
- Exclude or include outliers, namely the highest and lowest hours recorded for a specific work-center

We are planning future enhancements to limit production orders by SAP plant, to weight production order hours based on recency, and to automatically calculate learning curve factors based on the rate of improvement and the number of orders at each work-center.

Independent Assessments

The Pricing tab of the proposal was cleaned up and Independent Assessment results moved to a new Advanced tab with inputs for both the entire proposal and by phase (in the Phase tab) of:

- Minimum, max. and most-likely cost of the proposal from an independent assessment. This data is used to compare risk-adjusted proposal costs to the independently assessed cost range
- Performance risk factor which is used to give an independent assessment of the sum of weighted risks from the risk register
- G&A % baked into the business plan for the company, to model how not all the G&A cost associated with this new proposal need to be included in a proposal-specific profit margin analysis

Performance

Major improvements to performance were made in response to customer volume / stress testing including:

- Generation of the proposal cost model automatically in real-time using stored procedures, a fast SAP HANA database level script
- An option to run material consolidation and costing in “net change” mode which means that only materials where the data has changed (e.g. new or deleted BOM items) will be costed instead of re-costing thousands of products / materials each time
- Implementation of SAP HANA “workload classes” to streamline the background processes and to prevent long running background jobs – such as a full BOM explosion, lot-sizing and material costing for 50,000 parts – from delaying smaller, more urgent jobs such as proposal copies or new versions
- Database tuning and memory optimization including a recommendation to restart the servers on a round-robin basis when deploying updates or bug fixes in a production environment
- Optimization of bill of material import, cascade data or tags down large bills of material, copying or versioning large proposals and their underlying estimates, and opening very large estimates

Primavera P6 Integration

The integration between iPE and Primavera, which currently relies on Excel files being transferred between the two systems, was enhanced as follows:

- Updating of user date fields in Primavera from the resource or task start/end dates in iPE. This is necessary because Primavera does its own scheduling and does not accept external dates
- Configurable WBS and task P6 ID naming standards so that your company can match-up how iPE and P6 generate WBS and task internal ID's

The current interface supports creation of tasks and resource assignments in either direction (P6 à iPE or iPE à P6) but currently only supports the creation of WBS elements separately in both systems.

Project Baseline

When generating the project baseline in SAP, for proposal estimated costs, we discovered that SAP flatly rejects planned proposal costs if the work-center, plant, and activity type combination are not defined and planned properly in SAP in transactions CR02/KP26. Consequently, we enhanced our project baseline interface to look up the work-center, activity type, cost-center, and plant combination in SAP and if not found, then search for the same work-center in another SAP plant and use that work center instead.

At the same time special characters such as "%", which are permitted in the SAP material master description, were being rejected by the middleware which is SAP's Cloud Platform Integration (CPI) toolset. Consequently, we enhanced the SAP material master interface to strip out any invalid CPI characters, and to only retain 0...9 aA...zZ.

Proposal BOM

Enhancements to the proposal bill of material (BOM) in this version include:

- Option to cascade supply site, complexity and tag values assigned down the bill of material structure
- Option to search and filter the indentured product configuration or bill of material (BOM) to focus on specific part numbers
- Improvements to the BOM cost roll-up including calculation and display of the make or buy labor or material cost, burdens, summary of lower level component costs, and the equivalent cost of the BOM assembly (and its lower levels) for one end item

Proposal Bus. Unit

During the proposal set-up you specify the leading business unit as well as other units contributing resources to the bid. You can now select either a company or site as both leading and supporting business units. While companies map to SAP companies, sites in iPE typically map to your SAP plant codes, but could also map to your profit or cost-center hierarchy. If you select a site as the leading unit then the site's parent company is automatically adopted as the proposal company, with internal proposal costs computed in this currency.

At the same time, we added a delivery-from site to the proposal line item, which defaults from either the assigned WBS or the proposal set-up. The line item site, equivalent to the delivery-plant in SAP, informs iPE which SAP plant to check first when importing the bill of material (BOM) for any line items which are hardware or assemblies with a BOM. If there is a special procurement key in SAP which maps to an alternative “supply site” in iPE then the BOM for the material’s supply site is imported instead of the BOM for the site from the proposal line item

Proposal Scheduling

Rescheduling an entire proposal was included in this release with options to reschedule based on changes to the period of performance start date, end date, adjust all estimates to fit the new proposal dates, or stretch/shrink phases, WBS elements, tasks and labor estimates to fit the new proposal schedule and WBS/task durations. You now have the option to specify whether you want to reschedule or retain existing proposal dates when copying another proposal or importing from a template. Rescheduling is based on lead-time offsets and is not constraint-based currently.

Reports Menu

The reporting menu, which invokes SAP Analytics Cloud (SAC), Web-Intelligence (WebI), SAP Lumira or other reports built in your company’s preferred data visualization toolset via a URL, is now configurable. To define your own reports menu in iPE, add entries into the TwentyFiveConfig table of type report with the display name and URL for each report.

Usability

When you open each application you will now be automatically placed on whatever tab or page you were on last time you were in the same application, regardless of what proposal or estimate you were working on.