

Business Computing @ CERN

Visit of GSI / FAIR

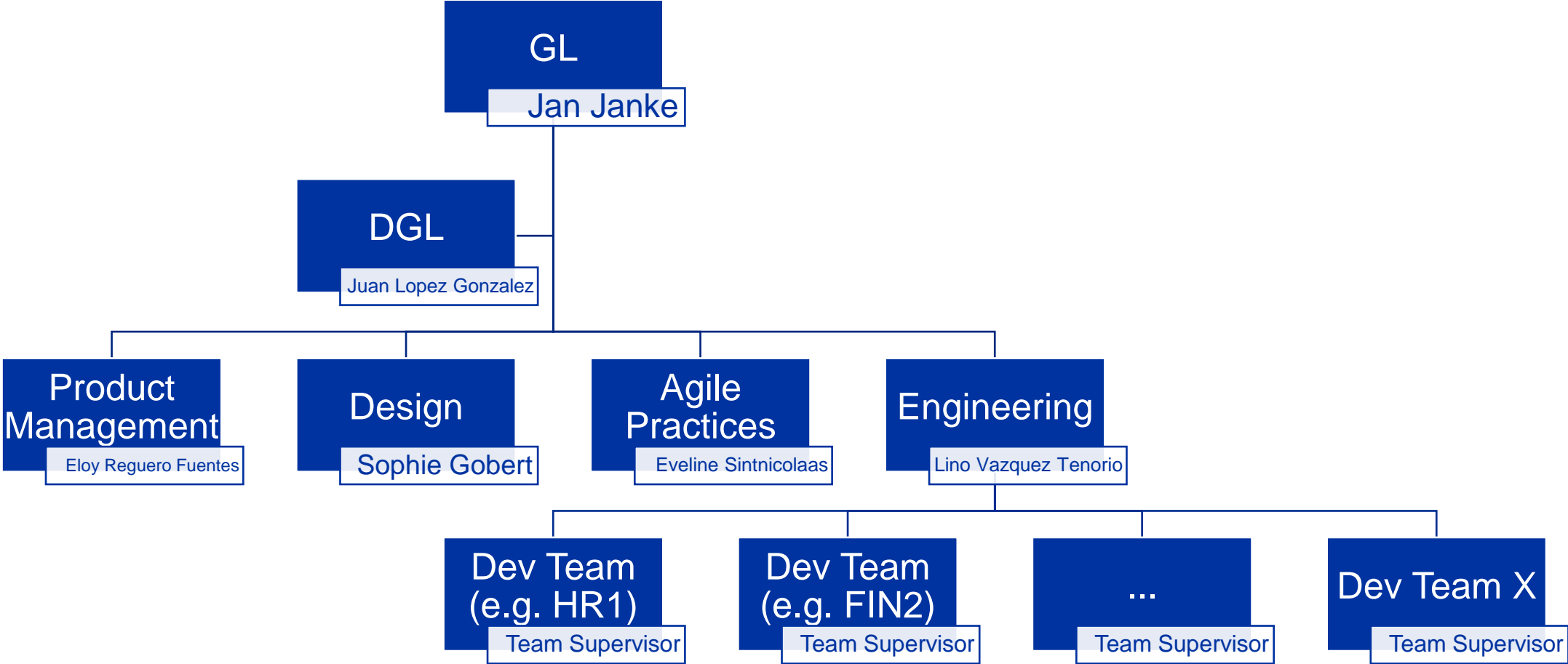
November 26th 2024

Jan Janke (CERN / FAP-BC)

In Short

- **Provide IT solutions to support CERN's administrative business processes**
- **5 products, 12 delivery teams**
- **Heterogeneous IT landscape: mix of bespoke and standard solutions**
- **75 CERN personnel members + ca. 50 people from near- and off-shore partners**
- **Central budget**
- **No scientific or research computing**

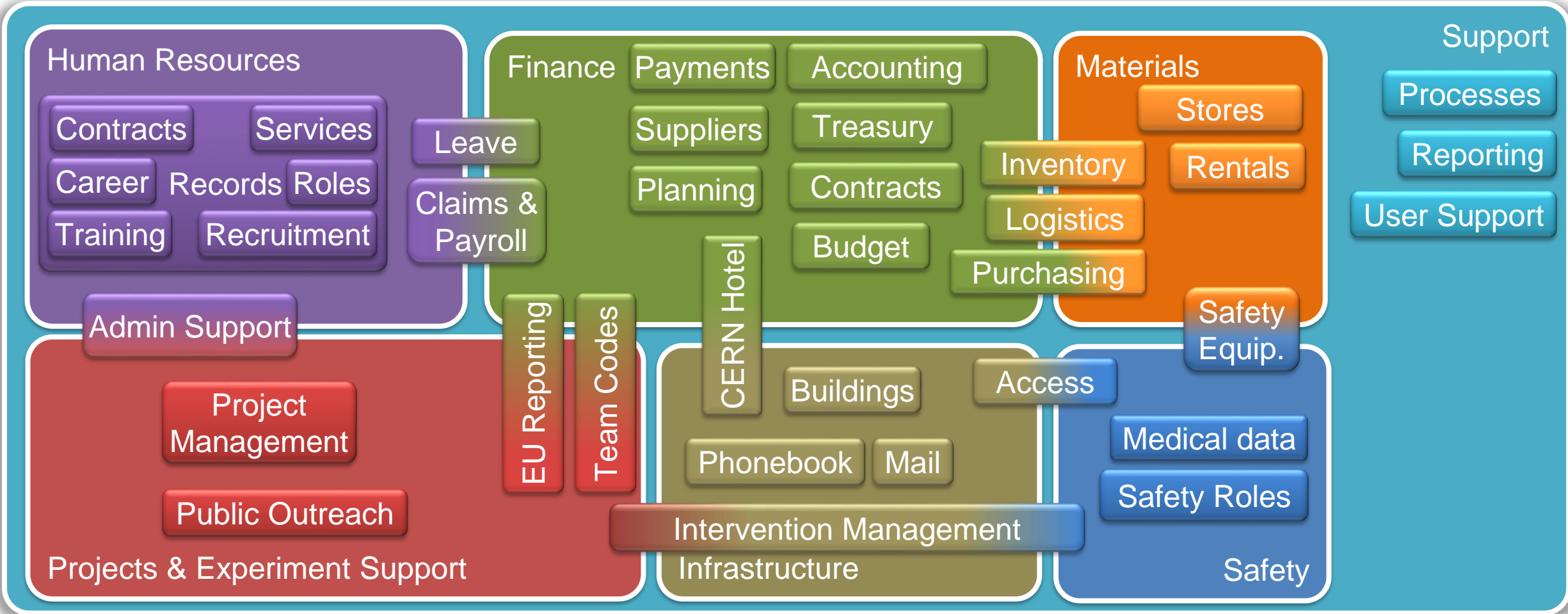
Internal Organisation



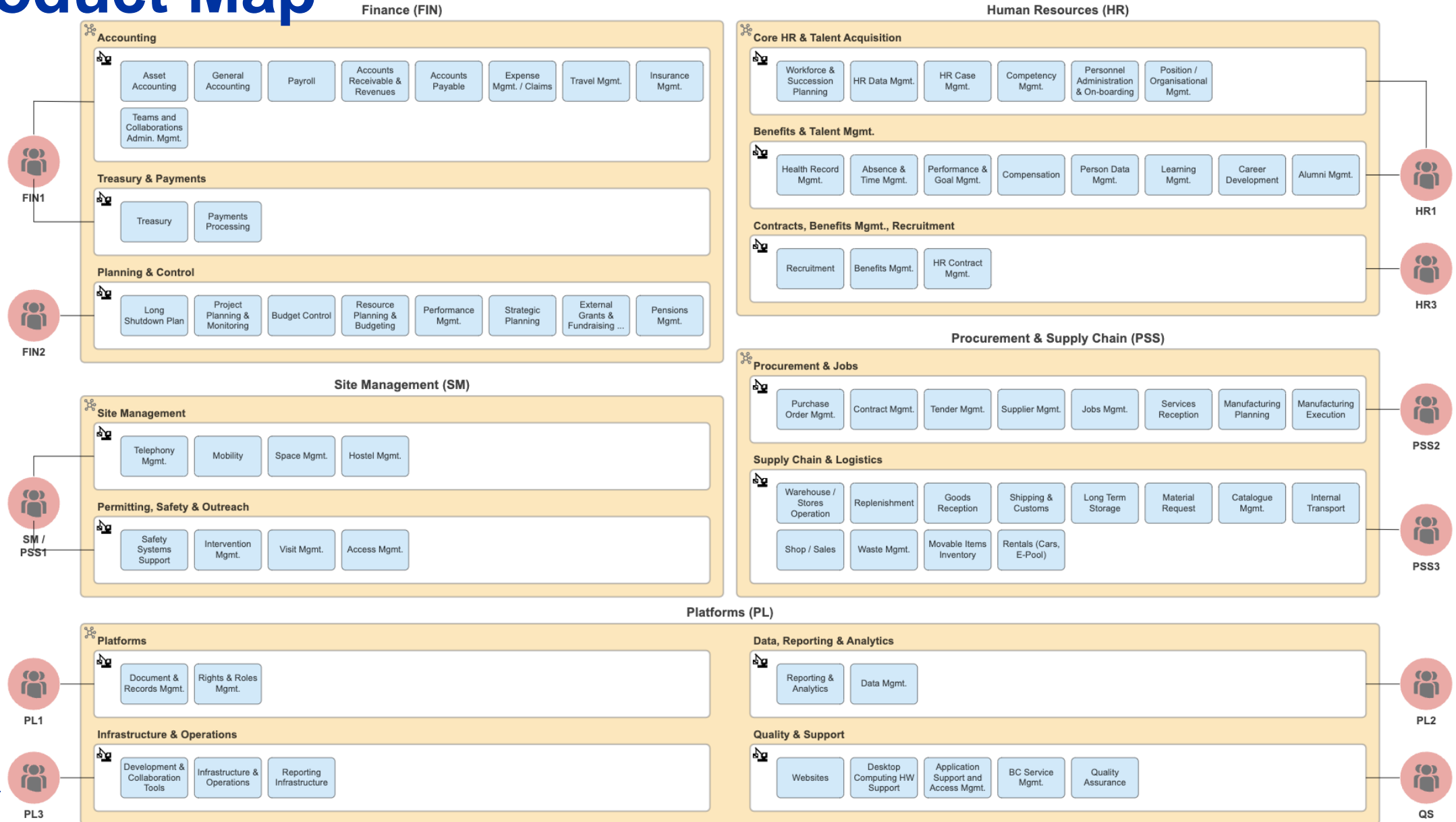
Group Size

- **Group size: ca. 75 members of personnel (50% staff, 50% graduates/students)**
- **High personnel turnover: ca. 20 arrivals and departures per year**
 - Consequence of CERN's education mandate and contract policy (short term contracts)
 - Half-life time of the group: ca. 2.5 years
- **Additional external workforce: ca. 50 people at the moment (not all full-time)**
 - Increasing reliance on near-/off-shore contracts in the future
 - Access to more experienced workforce at about the same cost as for graduates
 - Move part of the knowledge retention responsibility to external partners
- **Material budget: 4.5 MCHF for recurrent operations + variable project specific budget**
 - Solution delivery related costs (licenses, subscriptions, maintenance, consultancy, etc.)
 - Personnel costs for non-staff members (i.e. graduates, students, external workforce)
 - Training, travel, other expenses

Scope



Product Map



Application Landscape

- **266 active applications of varying size and complexity**
- **Around 25 external vendors**
 - Principal commercial system providers: Oracle (EBS), Cegid (XRP), Infor (LN)
- **Bespoke application development**
 - Main technologies: Java (Spring Boot), HTML/JavaScript (React), Oracle DB

ORACLE®
E-BUSINESS SUITE



Infor **LN**ⁱ

Separation of Concerns



what vs How

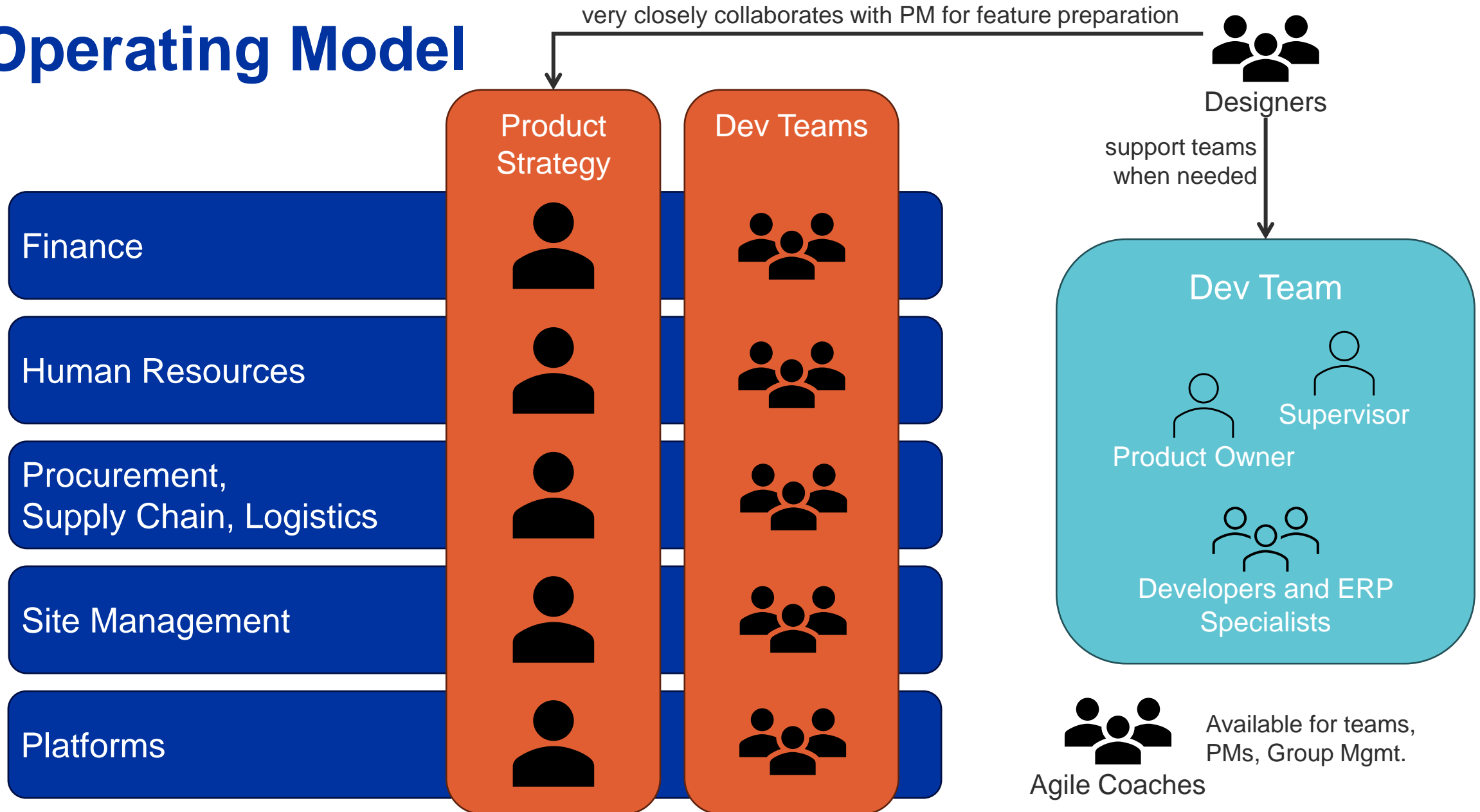
What Do We Do?

- **Defined together by business partners and BC Product Managers**
- **Driven by common multi-year vision and strategy**
- **Executed through commonly and quarterly updated agreed roadmap**
- **Product Manager / Business Relationship Manager**
 - Full time role
 - No people management (different skill, no distraction from core tasks)
 - Management by influence

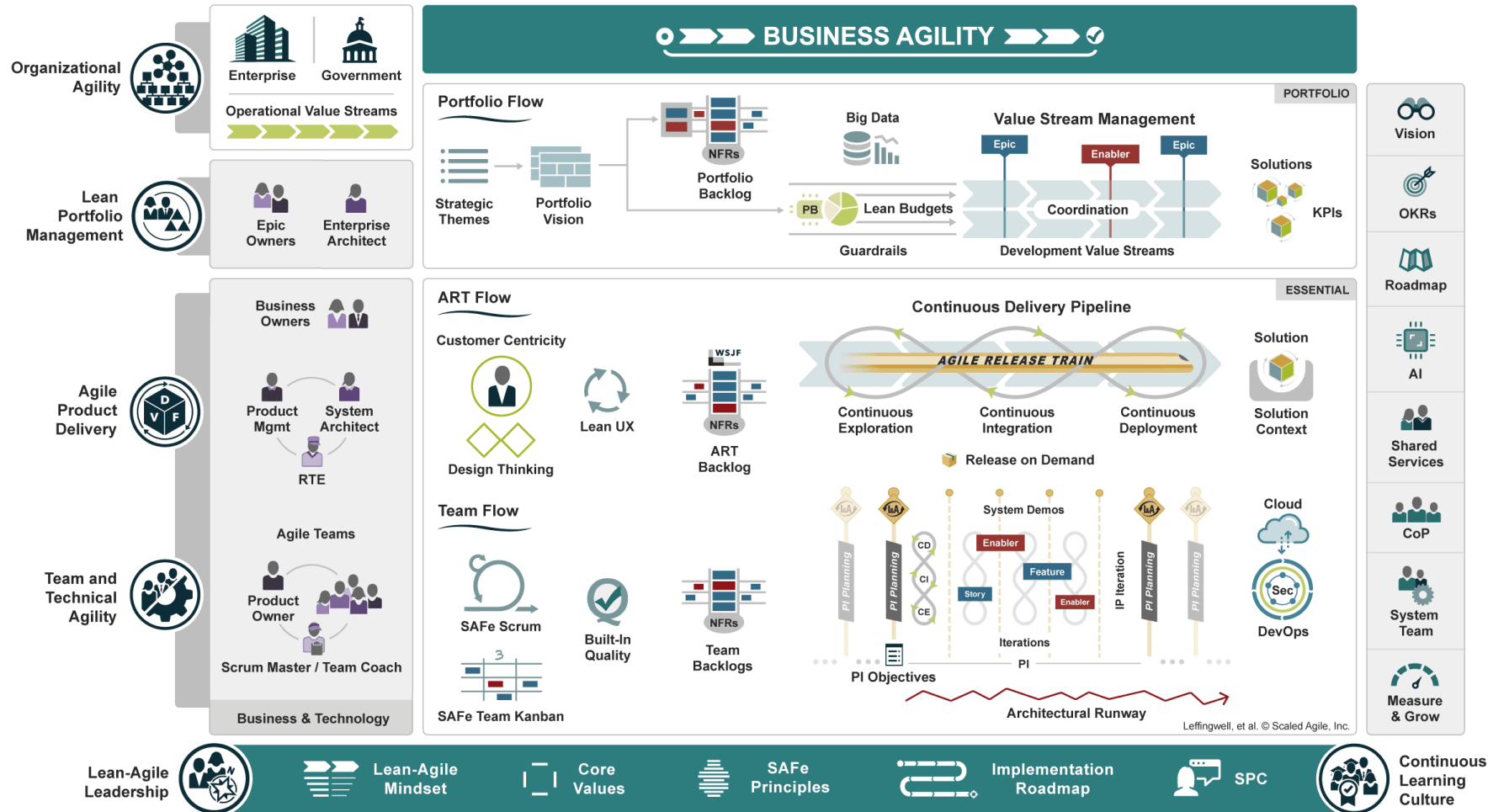
How Do We Deliver?

- **Agile solution delivery teams**
- **Concrete work defined by Product Owner who owns the backlog**
- **Each team has a people supervisor and technical lead**

Operating Model



Bringing Everything Together: SAFe



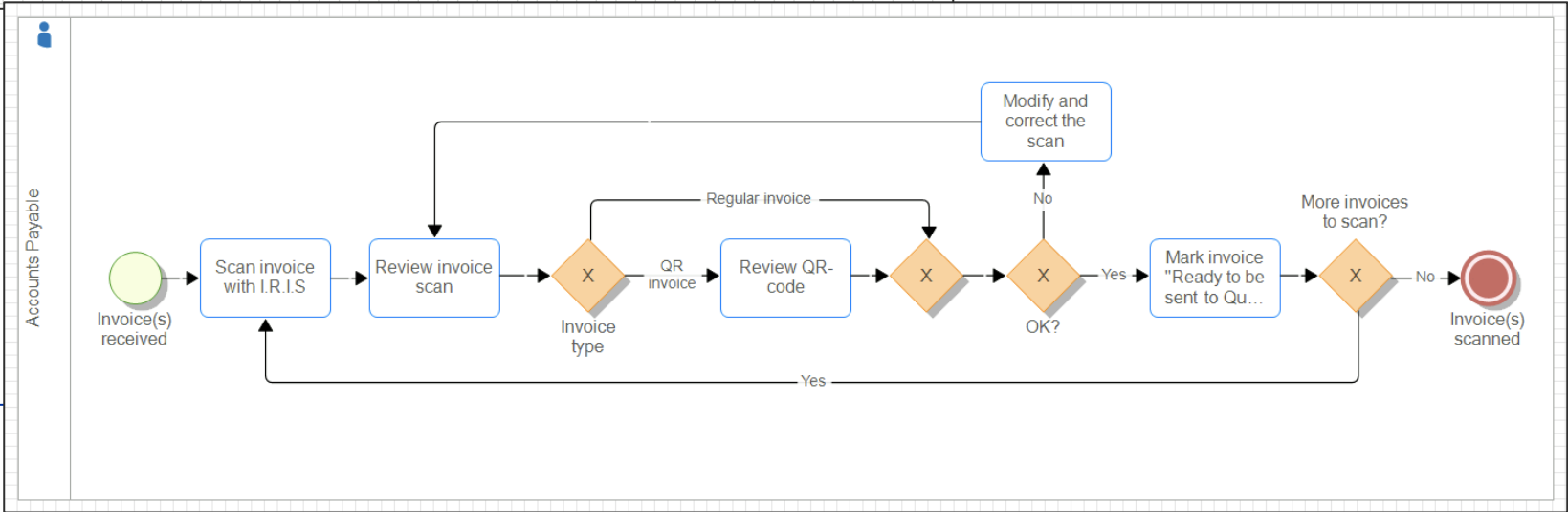
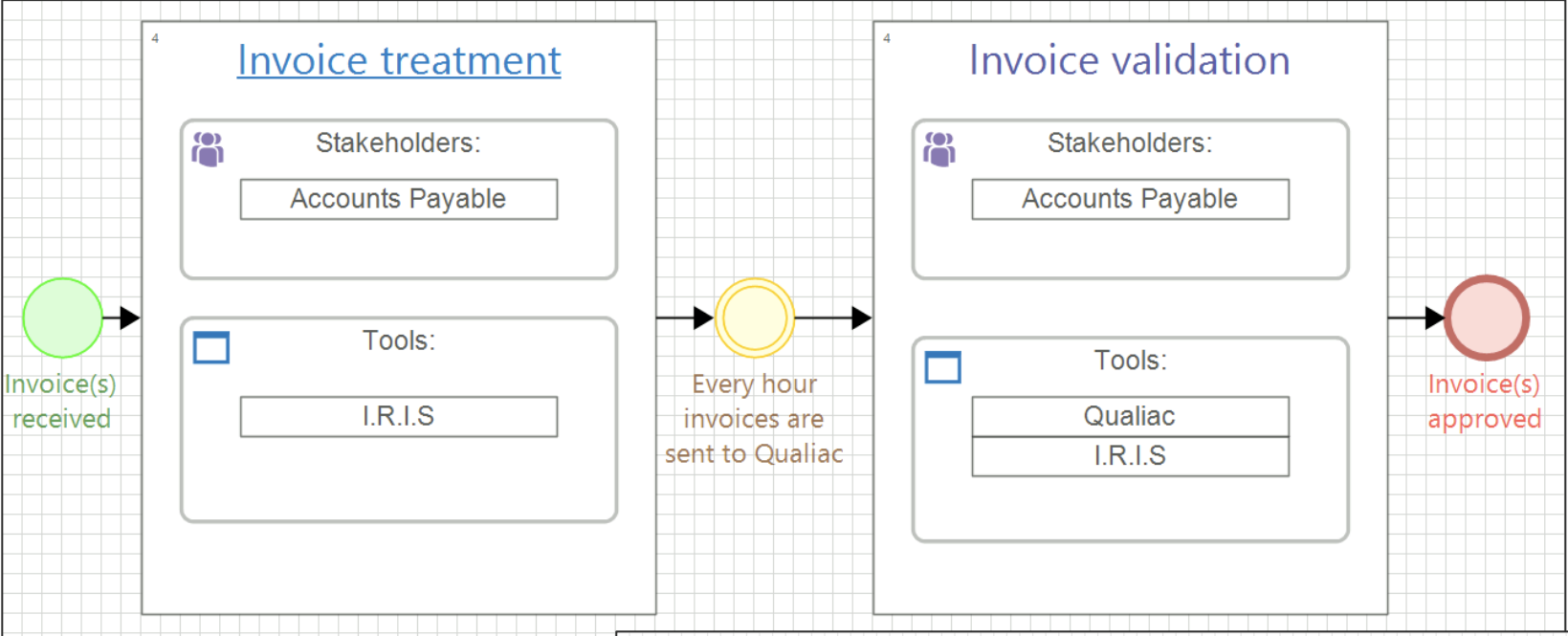
Delivery Cadence

- Value delivered throughout programme increments (quarters)
- Quarters divided into 2-week long sprints
- PMs provide features for the teams to work on during the next quarter
- Teams reserve capacity for ad-hoc work and support
- Product Owner manages the operational backlog
- Flexibility to adjust work programme if needed
- Deploy new solutions as early as possible, improve iteratively

Active Architecture Management

- **Lead Architect is a member of the extended group management**
- **Team of System Architects define policies and advice PMs, Designers, Teams**
- **Use of an EA Tool to describe products, processes, applications, and dependencies**
- **Explicit business process documentation**
- **Defined architectural guardrails for dev teams to follow**
- **Active management of technical debt (awareness, evaluation, reduction)**

Business Process Modelling

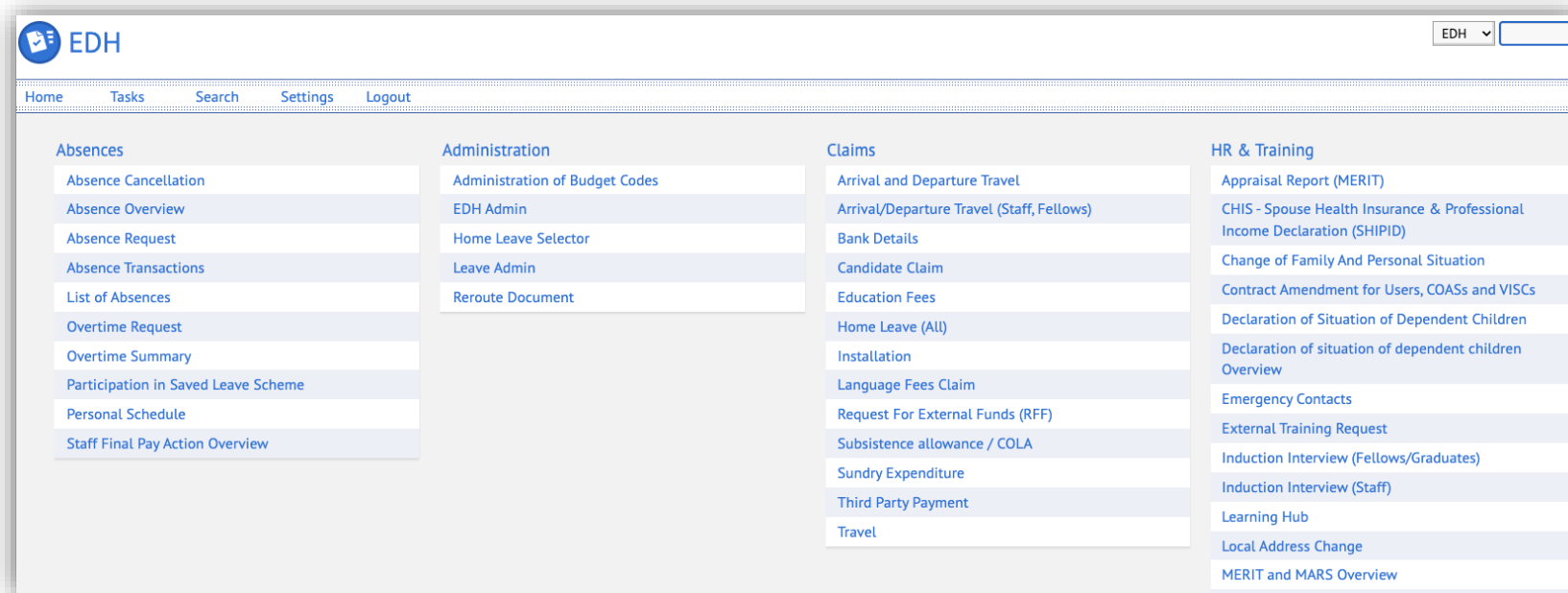


Technical Debt Exposure

ID	Name	← Business Capability (Uses)	← Team (Supports)	5. End of Life Date	TechBase	Arch	Quality	DevInfra	RunInfra	Security	Auditing	Privacy	TDC Total Numeric	TDC Total
(All)	(All)	(All)	(All)	--	(All)	(All)	(All)	(All)	(All)	(All)	(All)	(All)	(All)	(All)
AVCLPECT	AVCL/PECT	Payroll	FIN1	<Re...	XS	S	M	M	XXS	M		XL	4.8571	M
CANIRIS	Canon I.R.I.S.	Accounts Payable, Accounts Payable, FIN Accounting (Generic)	FIN1	<Req... uire...					L	M	S	S	4.75	M
CET	CET	General Accounting	FIN1	<Re...	S	XXL	XXL	M	M	S	M	XL	9.5	L
FINACETL	Reporting for FIN Accounting: DWH ETLs	FIN Accounting (Generic)	FIN1	<Re...	S		XL	M	S				6	M
FINACREBO	Reporting for FIN Accounting: Business Objects	FIN Accounting (Generic)	FIN1	<Re...	XXL		L						14.5	XL
FINACREPE	Reporting for FIN Accounting: Pentaho reports	FIN Accounting (Generic)	FIN1	<Re...	S		M	M	S	XXS			3.4	S
FINACRESHINY	Reporting for FIN Accounting: Shiny apps	FIN Accounting (Generic)	FIN1	<Re...	S	S	S	XS	S				2.8	XS
FINACRER	Scheduled R Reports	FIN Accounting (Generic)	FIN1	<Re...	S	S	S	XS	S				2.8	XS
GARBANC	Garanties bancaires	Accounts Payable	FIN1	<Re...	M	M	S	S	S	S	XL	M	5	M
HRA	HR Access	Payroll	FIN1	<Re...	S	S	M	S	S	M	S	XL	4.75	M
KYRIBA	Kyriba	Payments Processing	FIN1	<Re...					S	S	S		3	S
PAYTLS	Pay Tools (summer student payments + salary advances)	Payroll	FIN1	<Re...	M	M	M	S	S	S	XL	XL	6.25	M
NXTLS	NXTools/Pay Slips scripts	Payroll	FIN1	<Re...										
QUALFI	CEGID XRP Ultimate - Qualiac Finance	General Accounting, Treasury, Treasury, Treasury	FIN1	<Req... uire...	M	M	L	M	S	S	L	XL	6.25	M
QUALSA	CEGID XRP Ultimate - Qualiac Sales	Teams and Collaborations Admin. Mgmt.	FIN1	<Re...	M	M	L	M	S	S	L	XL	6.25	M
APT	APT	Resource Planning & Budgeting	FIN2	<Re...	XL	XL	L	XXS	L	M	M	XL	8.25	L
FIN-MDM-API	Financial Master Data (Cost Centre) Mgmt. API	Resource Planning & Budgeting	FIN2	<Re...	XS	XS	XS	XXS	XXS	S	M	M	2.625	XS
FIN-MDM-UI	Financial Master Data (Cost Centre) Mgmt. UI	Resource Planning & Budgeting	FIN2	<Re...	XS	XS	XS	XXS	XXS	S	M	M	2.625	XS
PLAN	PLAN	Long Shutdown Plan	FIN2	<Re...	L	L	S	XXS	L	M	S	L	5.5	M
PPT-EU	PPT/EU	External Grants & Fundraising Mgmt.	FIN2	<Re...	L	M	S	XXS	XXS	S		M	3.7143	S
REORG	Reorg Tool	Resource Planning & Budgeting	FIN2	<Re...	XL	L	L	XXS	L	M		XL	8	L
FINPCRE	Reporting for FIN Planning & Control	FIN Planning & Control (Generic)	FIN2	<Re...								XL	13	XL
ALUM	Alumni Platform	Alumni Mgmt.	HR1	<Re...						M		XXL	13	XL
ALUM-DB	Alumni DB	Alumni Mgmt.	HR1	<Re...	XXS	S	L	S	XXS	S	XL	XXL	6.625	L
CHISP	CHIS Pensioners Extractions	Benefits Mgmt.	HR3	<Re...	L	XS	M	XXS	M	S		XXL	6.4286	M

Integrating Everything

- Centralised "Foundation" database
- In-house developed workflow management system "EDH"



Example: P

Document Status

10096599 - Purch

This document has

Created by [Jan JANKE](#)
 Created by BAAN: No
 iValua link:

General Informat

General Description *

Technical Contact *:
 Contract:
 Departmental Reques
 Supplier:
 Contact for order:

Currency *:
 Transport Cost *:
 Packaging *:
 Indicate whether this

Articles appearing in t

Order Lines

Item	Quantity	Description
1	1	Future
1		-Detail intern Countr until:3 Budget

09.01.2024 13:46 Approved by creator Jan JANKE

09.01.2024 13:46 With [redacted] forwarded by Jan JANKE awaiting approval

09.01.2024 13:48 Approved by [redacted]

09.01.2024 13:48 Jan JANKE has already signed as responsible for 5000 CHF on 71611

09.01.2024 13:48 Jan JANKE has already signed as responsible for 10000 CHF on 71611

09.01.2024 13:48 With [redacted] as responsible for unlimited amount on 71611 awaiting approval

11.01.2024 09:46 Approved by [redacted]

11.01.2024 09:46 With [redacted] as Material Specialist awaiting approval

11.01.2024 14:34 Approved by [redacted]

11.01.2024 14:34 With Purchase Officer Pool awaiting approval

12.01.2024 15:03 Document has been assigned to [redacted] for processing

12.01.2024 15:03 With Purchase Officer Pool awaiting approval

12.01.2024 15:46 Document has been assigned to [redacted] for processing

12.01.2024 15:51 With Purchase Officer Pool awaiting approval

12.01.2024 15:54 Document has been assigned to [redacted] for processing

12.01.2024 15:55 Approved by [redacted]

12.01.2024 15:55 [redacted] comments: Managed by [redacted] as previous COMM1 of the Price Enquiry

12.01.2024 15:55 [redacted] comments: Total spend before this order [redacted]

12.01.2024 15:55 [redacted] comments: This order [redacted]

12.01.2024 15:55 [redacted] is absent from 16.10.2023 until 13.01.2024

12.01.2024 15:55 [redacted] is absent from 11.01.2024 until 13.01.2024

12.01.2024 15:55 With [redacted] as Section Leader of IPT-PI-OE awaiting approval

12.01.2024 16:54 Approved by [redacted]

12.01.2024 16:54 With [redacted] as Signatory awaiting approval

12.01.2024 18:22 Approved by [redacted]

12.01.2024 18:22 With [redacted] as Signatory awaiting approval

15.01.2024 09:35 Approved by [redacted]

15.01.2024 09:35 Transferring to Purchasing service

15.01.2024 09:35 Document has been transferred

15.01.2024 09:35 The document has been fully authorized

15.01.2024 15:52 Order transferred to the accounting system Gti

15.01.2024 16:05 View order at: <http://edh.cern.ch/Info/Order/CD/1095502>

04.03.2024 11:16 Invoice matched to order lines

12.03.2024 20:19 Order transferred to the accounting system Gti

12.03.2024 20:19 Invoice 3758103 registered; sup ref: 2000274059 date: 16/02/2024 value: [redacted]

13.03.2024 10:45 Invoice 3758103 ; sup ref: 2000274059 Payment date: 14/03/2024

Attach **3** Document

[Procurement Guidelines](#)

[redacted] B: 0.929800 as of date 09.01.2024

Unit Price	Price
[redacted]	[redacted]

**We Are Starting a
Transformation Phase**

Where Is BC Today (Nov 2024)?

- **Heterogenous mix of standard and bespoke software**
- **Many applications based on a wide technology landscape**
- **ERPs selected 20-30 years ago as part of a best-of-breed strategy**
- **EDH provides access to 80+ electronified business processes**
- **Highly diverse reporting landscape : HRT, CET, Pentaho, R, Power BI**
- **Maintenance is difficult due to a high degree of customisation**
- **Hard to benefit from new features and innovations in standard software**
- **Talent management challenging (turnover, unattractive tech stack, complexity)**

BC Recognizes That ...

- **Vision can only be achieved in a partnership with CERN's business units**
- **Business processes require standardisation to embrace market solutions**
- **Cost reduction within BC is not a goal (BC's budget corresponds to ca. 1% of CERN)**
- **“Best-of-breed” results in managing a complex integration landscape**
- **BC cannot compete with external vendors in most cases**
- **BC builds solutions for the entire CERN community and not only for the FHR sector**

Vision for the Future

Highly integrated cloud-based standard solutions

One integrated Enterprise system covering CERN's business processes

Two-fold reporting strategy (advanced and general-purpose)

Inhouse development for CERN specific processes and integrations

HCM/ERP system integrated workflows and EDH co-exist

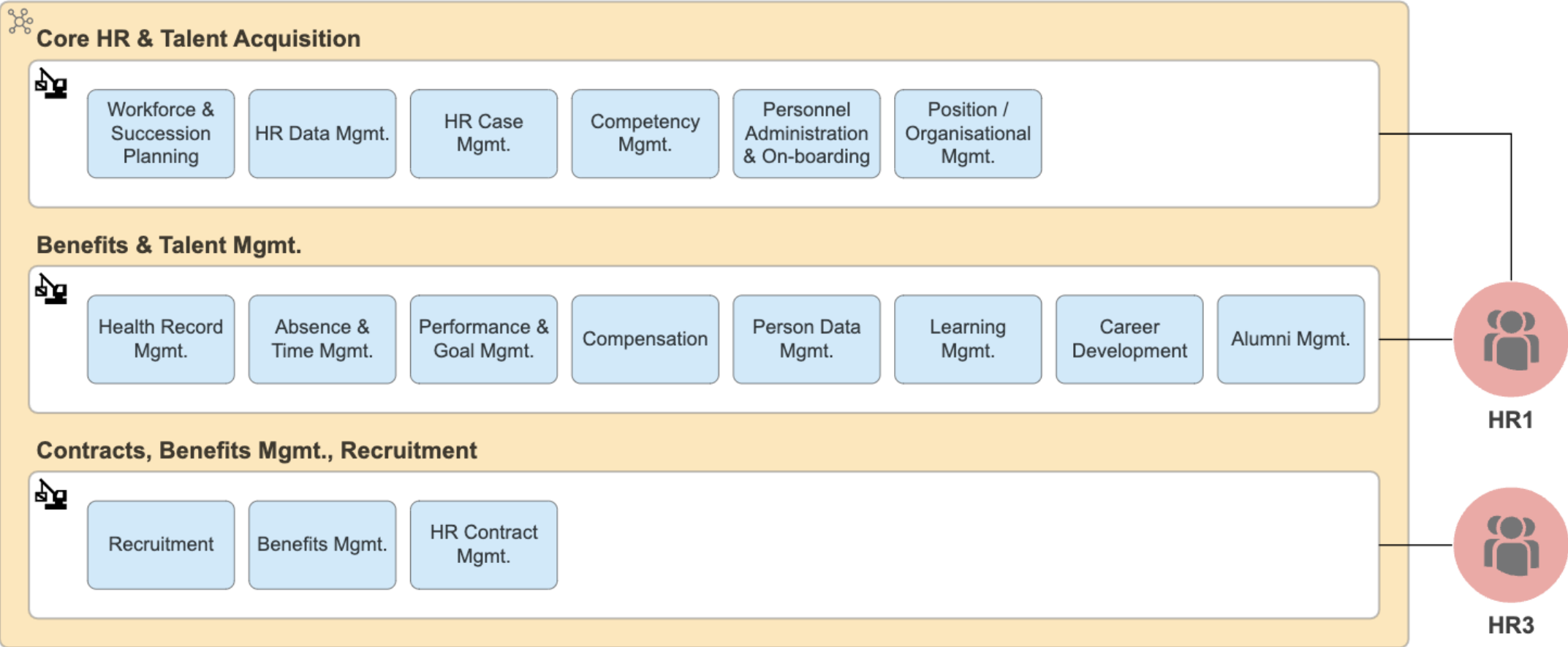
Why 1 Single HCM/ERP?

- **Benefits for Business Partners and End Users**
 - **Uniform user experience** across business domains
 - **Shared set of master data** not subject to error-prone in-house developed integration pipelines
 - Use of a **widely proven standard solution** / possibility to exchange experiences w. outside users
 - Closely follow the vendor's update cadence and **quick access to the latest innovations** (e.g. AI)
 - More powerful **out-of-the-box reporting** available by default
- **Efficiency Gains within BC**
 - **Less custom** in-house developed system **integrations**
 - Strongly **simplified technical stack** (one core tech, Low/No Code for configuration/extension)
 - **Easier access** to needed skills/competencies on the **job and professional services** markets
 - **Easier to reassign people** to a different solution delivery team within BC (due to uniform tech stack)
 - Move responsibility for **hardware maintenance** and linked technical debt to **external vendor**

Transformation Starts with CERN's HR Processes

Principal Processing Service for HR Data


























Human Resources (HR)



Hire To Retire

- **Talent Acquisition – Onboarding – Talent Management – Offboarding**
- **Different solutions for Recruitment, Learning, Core HR, Payroll**
- **Principal system's EOL reached, support ends 2032**
- **Opportunity to simplify, integrate more and standardise**

Future HR Information System Scenarios

	Highly integrated solution	Hybrid systems	Diversified systems
Explanation	A single platform that supports most processes in HR	A combination of an integrated solution for a cluster of main HR activities supplemented with niche or in-house built applications for specific HR processes	Leading applications, systems and niche software that are tightly integrated or flow into a strong database
 Cost effectiveness Supports all HR processes in a cost-effective way (don't exceed the total costs of today)	 <ul style="list-style-type: none"> Investment and not expenditure High licence and implementation cost Long-term less maintenance cost ROI in the long-term (e.g., reduce inefficiencies and errors). 	 <ul style="list-style-type: none"> Affordable investment Licence and implementation costs for the required functionalities only Long-term higher integration costs 	 <ul style="list-style-type: none"> Short-sighted investment Multiple contracts, high integration and maintenance cost Requires a lot of maintenance and is not sustainable
 Real-time data verification Offers real-time data verification and validation at three stages	 <ul style="list-style-type: none"> Built in features to verify the accuracy and completeness of data in real-time 	 <ul style="list-style-type: none"> An internal project to build validations capabilities in legacy systems Utilize the built in features to verify the accuracy and completeness of data in real-time – for the external applications 	 <ul style="list-style-type: none"> Built in features to verify the accuracy and completeness of data in real-time and extra efforts to build in the feature when the data is integrated or rely on post data input (at a data layer)
 Multilingual availability Available in English and French languages	 <ul style="list-style-type: none"> The platforms proposed already provide multilingual feature 	 <ul style="list-style-type: none"> The platforms provide multilingual feature 	 <ul style="list-style-type: none"> Each platform needs to be individually ascertained.
 Optimal use of the solution(s) Limits the need for software customization by offering pre-built, and CERN-specific configuration capabilities	 <ul style="list-style-type: none"> Integrated solutions promote standardization. Customisation is a costly intake. All functionalities and features of platforms may not be applicable for CERN's requirements. 	 <ul style="list-style-type: none"> Provide interim solution with a modular transformation Medium Integrations and interfaces with external applications Cost benefit analysis on implementing each module as per CERN's usage to a fully integrated phased wise solutioning 	 <ul style="list-style-type: none"> Heavy integrations and interfaces between one application to another Maintenance team on each application Maintenance team on integrations and interfaces for upgrades
 Enhanced by modern and sustainable technologies Future-proof and can be sustained for the long term	 <ul style="list-style-type: none"> Long term beneficial solution All platforms suggested have high inclination on sustenance for long term 	 <ul style="list-style-type: none"> Careful considerations on the transformation journey to be applied If applied* the platform can be sustained for a long term built with modern technology as and when required by CERN 	 <ul style="list-style-type: none"> Not beneficial in long term Each time of selection, the selection criteria needs to be considered
 Mixed best-in-class approach The HR system landscape relies on a strong core system covering main HRIS functionalities, supplemented with best-in-breed applications	 <ul style="list-style-type: none"> Standardisation of processes and functionalities limits the platforms to provide very unique features that are provided by a boutique platform. However, they come with very flexible APIs 	 <ul style="list-style-type: none"> As and when the need arises the module can be activated and implemented Strong APIs will keep the platforms up-to date on integration 	 <ul style="list-style-type: none"> Boutique platforms have their unique features that can be applied to CERN's particular requirements
	 Target scenario		

Challenges

- **High degree of customisation in CERN systems**
 - Reduces benefit of relying on a standard market solution
- **Successfully decustomised Logistics/Supply Chain solution (infor LN 10.7)**
- **Finance processes relatively standard (IPSAS compliant)**
- **HR processes partially harder to standardise**
 - CERN has three roles: employer, state, university
 - Processes encompass
 - health ensurance, pension fund, family benefits, host state legitimation documents mgmt.
 - external partner institute scientists mgmt. etc.

Opportunities

- **HR system landscape shaped during the 1990s, a lot has changed since then**
- **Review our internal processes**
- **Distinguish between areas where CERN needs to be different and where not**
- **Standard solutions imply availability of external expertise and resources**
- **Less integration points between systems**
- **Much improved reporting out-of-the-box**
- **Iterative process: start with HR, consider further integration of FI, Procurement, etc.**



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