Elements of a professional framework for technology development and innovation

CAST INTERNATIONAL FORUM

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Engineer your career • Improve our society


An engineer's career is never straightforward, but their professional development should be.
internship
curriculum vitae
new job
learning experience
new team
need new skills
portfolio
job searching
new company
cancelled project
new role
big project
patent
budgets
portfolio update
self-employed
staff training
new client

Importance of Professional Development

Due to the speed of technological progress and advancements, it is more important than ever that engineers are constantly learning and professionally developing themselves. This includes:

- The theoretical knowledge of new and advancing technology in their workfields and others'
- New applications, methods, processes, and systems
- Sustainability and ethics
- Development of professional skills as well as technical knowledge.

Learning and opportunities to learn do not stop at graduation, but the structure for learning does.

CHALLENGES (1/2)

What are today's challenges in the engineering sector?

- very rapid technology development
- increasing multi-faceted problems that need a multi-disciplinary approach
- complex projects requiring strong leadership, excellent project management and quality control
- issues with safety, sustainability and professional ethics

CHALLENGES (2/2)

What are today’s challenges in the engineering sector?

- In all technical sectors transformations are taking place, in terms of knowledge, issues and roles

- young professionals have difficulty in acquiring the skillset to grow to more senior positions

- current pool of engineers may (partially) not have the desired skill set that is needed to take on current and future ambitions; this may be the case both on company level as well as on national level

PROFESSIONAL FRAMEWORK

competence based

- To help deal with the challenges
- and foster technology development and innovation
- from 3 perspectives:

- **Personal**: the individual engineer

- **Industry**: advancement for individual companies and for sectors as a whole (e.g. building, infrastructure, mobility, high tech, process industry etc.)

- **Society**: to serve the public and the public interest

ADVANTAGES OF FRAMEWORK

- Support through different career stages, jobs, companies and roles.

- Advancement of technical knowledge while broadening professional skills.

- Engineers can identify areas that they are strong in or may need more development. Therefore they can set goals and advance quicker.

- More focussed learning

- Promotes innovation and creativity

- Gives context to both formal and non-formal learning, across multiple disciplines

- Company and industry benefits by giving alignment on strategy

PROFESSIONAL FRAMEWORK

competence based

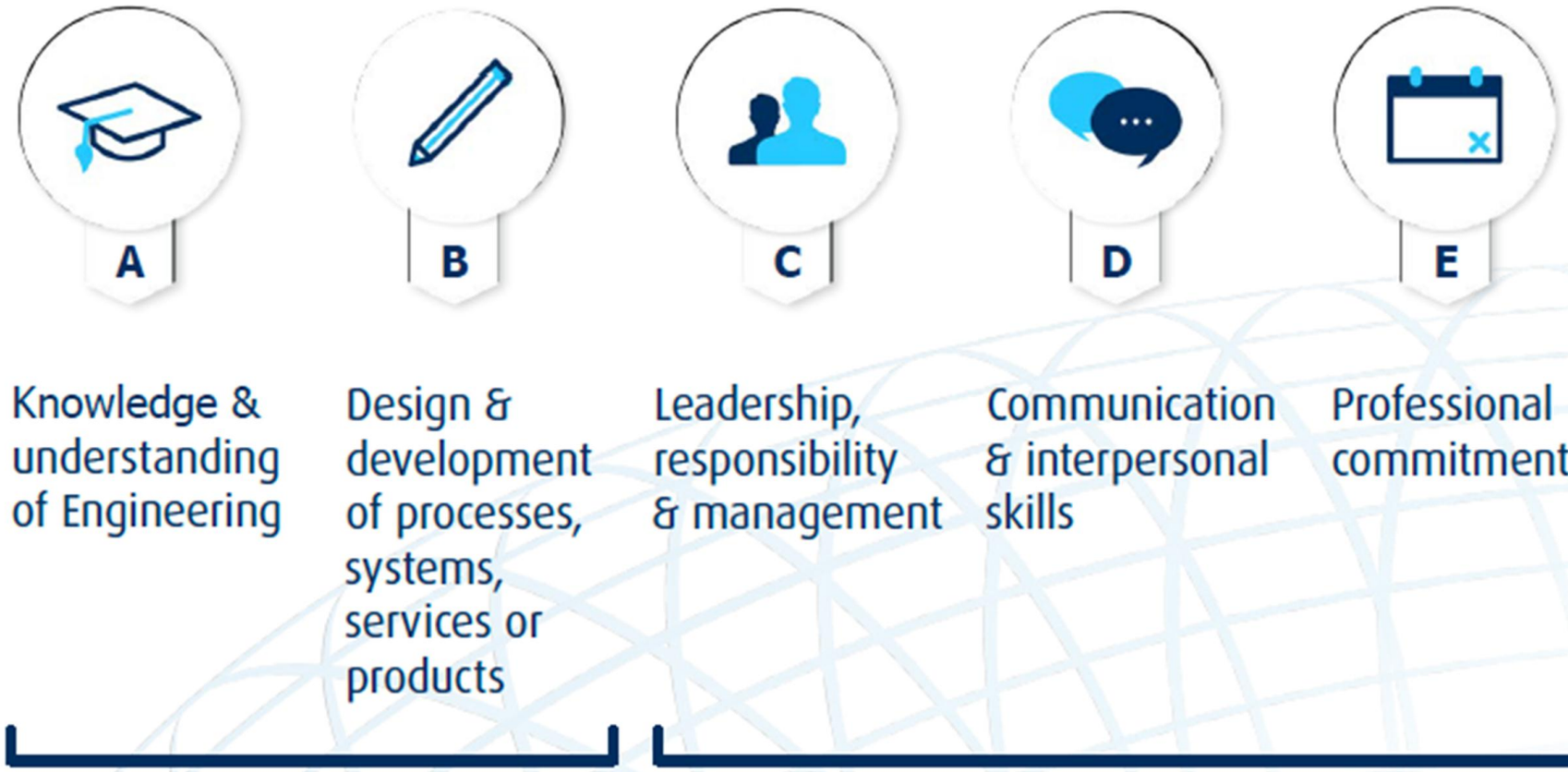
Focus on the requirements necessary to sustain engineers who serve our societies

and are excellent, innovative, uphold high

ethical standards and a sustainable development

COMPETENCE AREAS

KIVI’s 5 core competence areas.



COMPETENCES

These 5 core-competence areas are broken down into 18 sub-competencies.

COMPETENCE A

Knowledge and understanding of engineering

A1: Extend your theoretical knowledge of new and advancing technology.

A2: Contribute to the development of the theory of engineering technology.

COMPETENCE B

Design, develop and create innovative products, systems, processes or services

B1: Identify potential projects and opportunities.

B2: Conduct appropriate research, and undertake design and development of new and creative engineering solutions.

B3: Manage implementation of design solutions, and evaluate their effectiveness.

B4: Exercise sound judgement when stakes are conflicting or knowledge is incomplete.

COMPETENCE C

Leadership, responsibility & management

C1: Plan for effective project implementation.

C2: Budget, organise, direct and control tasks, people and resources.

C3: Lead teams and develop staff to meet changing technical and managerial needs.

C4: Bring about continuous improvement through quality management.

C5: Be a leader within your work field and society.

COMPETENCE D

Stakeholders, communication & interpersonal skills

D1: Identify all stakeholders and communicate with others at all levels.

D2: Present and discuss proposals.

D3: Demonstrate personal and social skills, including the ability to work in teams.

COMPETENCE E

Professional commitment

E1: Demonstrate ethical behaviour and comply with relevant legal and regulatory requirements.

E2: Design, manage and apply safe systems of work.

E3: Undertake engineering activities in a way that contributes to sustainable development and a circular economy.

E4: Demonstrate your development strategy and how you plan to carry out and record CPD in order to maintain and enhance all competences A-E.

PROFESSIONAL REGISTRATION

THE CHARTERED ENGINEER STANDARD

KIVI offers two professional titles:

Chartered Engineer (CEng)

Incorporated Engineer (IEng)

Provides an internationally recognised qualification, based on a high quality standard and commitment to ethics and to continuous professional development.

- Degree required
- Minimum 5 years work experience
- Portfolio assessment
- 90 minute Professional Review Interview
- Mandatory CPD

https://www.kivi.nl/chartered

Chartership pins

CONTINUOUS PROFESSIONAL DEVELOPMENT

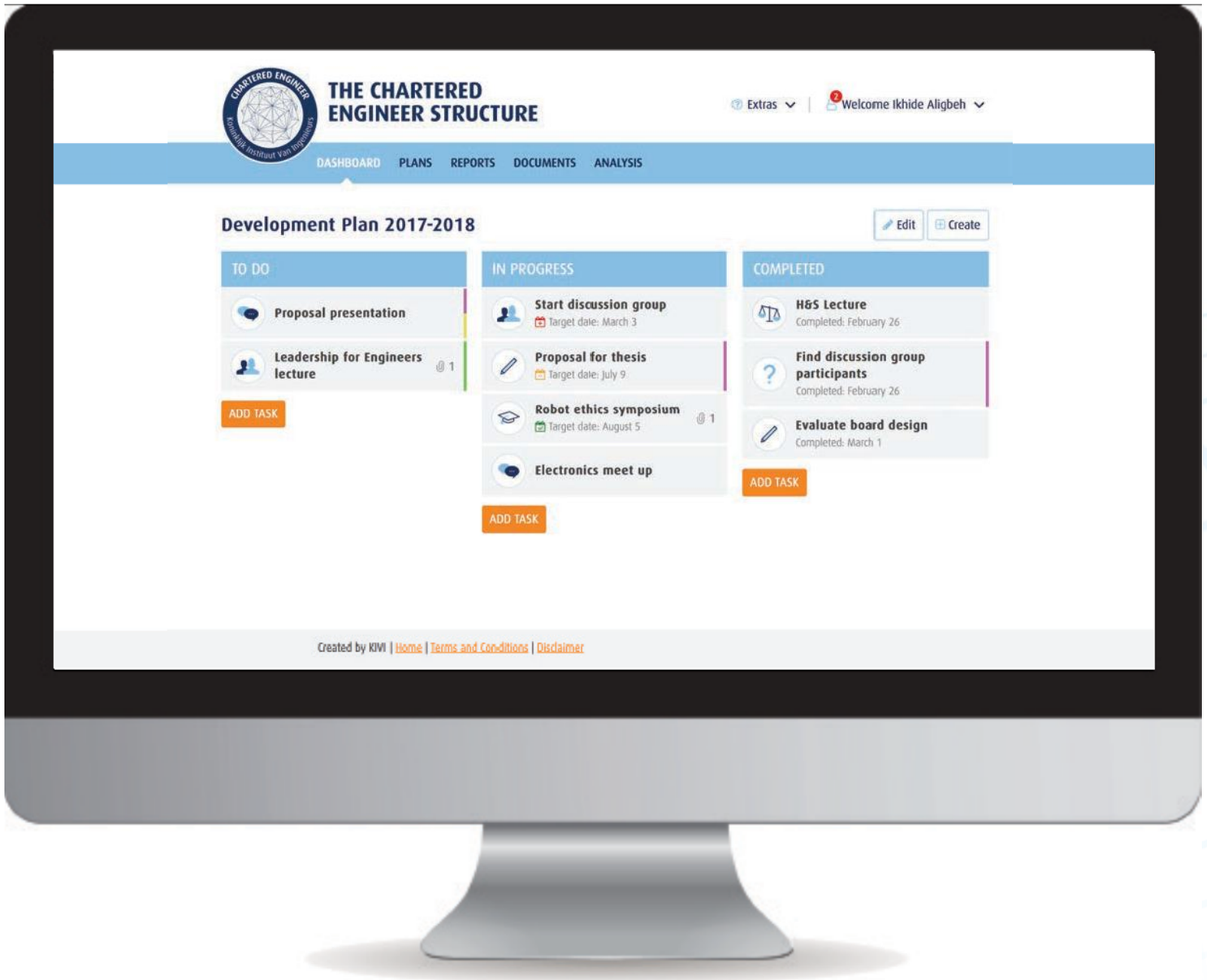
we take a broader perspective

- Formal education and courses through university and research institutions
- Non-formal learning at company
- Industry-academia research projects
- Peer-to-peer interaction within and outside sector
- Coaching of young engineers and students

The Professional framework assures that development is coherent, holistic and well-rounded

Key aim is to pursue excellence and innovation on a personal, company and industry level, and improve society

THE ONLINE PROFESSIONAL DEVELOPMENT TOOL (OPD)



MAIN FUNCTIONS:

- Professional Planning
- Analysis and Strategy
- Portfolio Development
- Reports for yourself, mentors and employers
- Professional Registration
- CPD Tracking

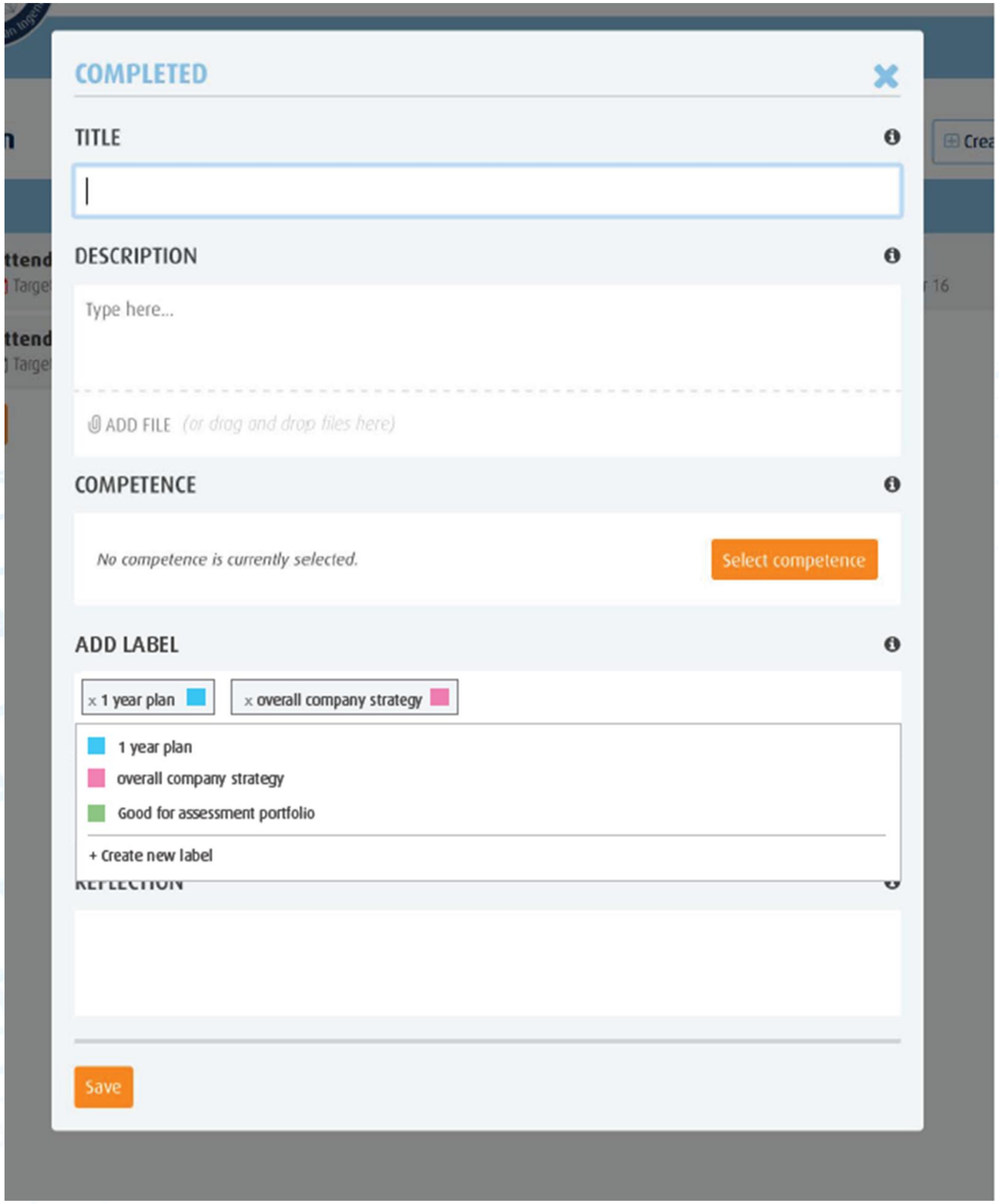
PLAN STRUCTURE

Supports competence based

reflective learning

and align personal goals

with company strategy



REPORTING AND ANALYSIS

ZELFBEOORDELING 2017

Isaac Aligbeh
2 April 2018

DETAILS

Plans
Development plan 2017
Project Bridge

Competence
C,D,E

Status
To do
In progress

Labels
No labels

Dates
All dates

TASKS

TO DO
2 tasks

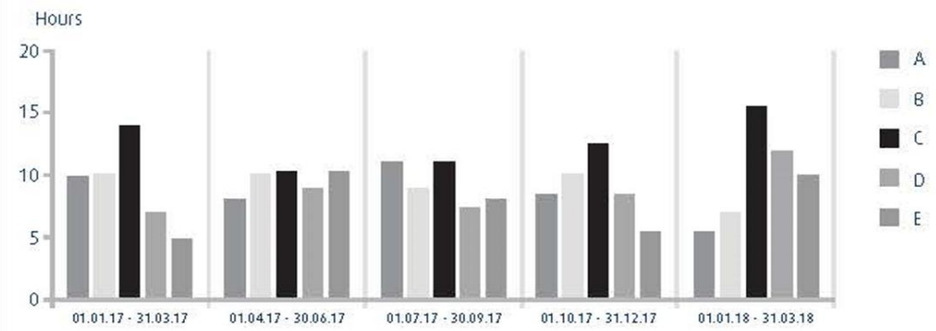
IN PROGRESS
8 tasks

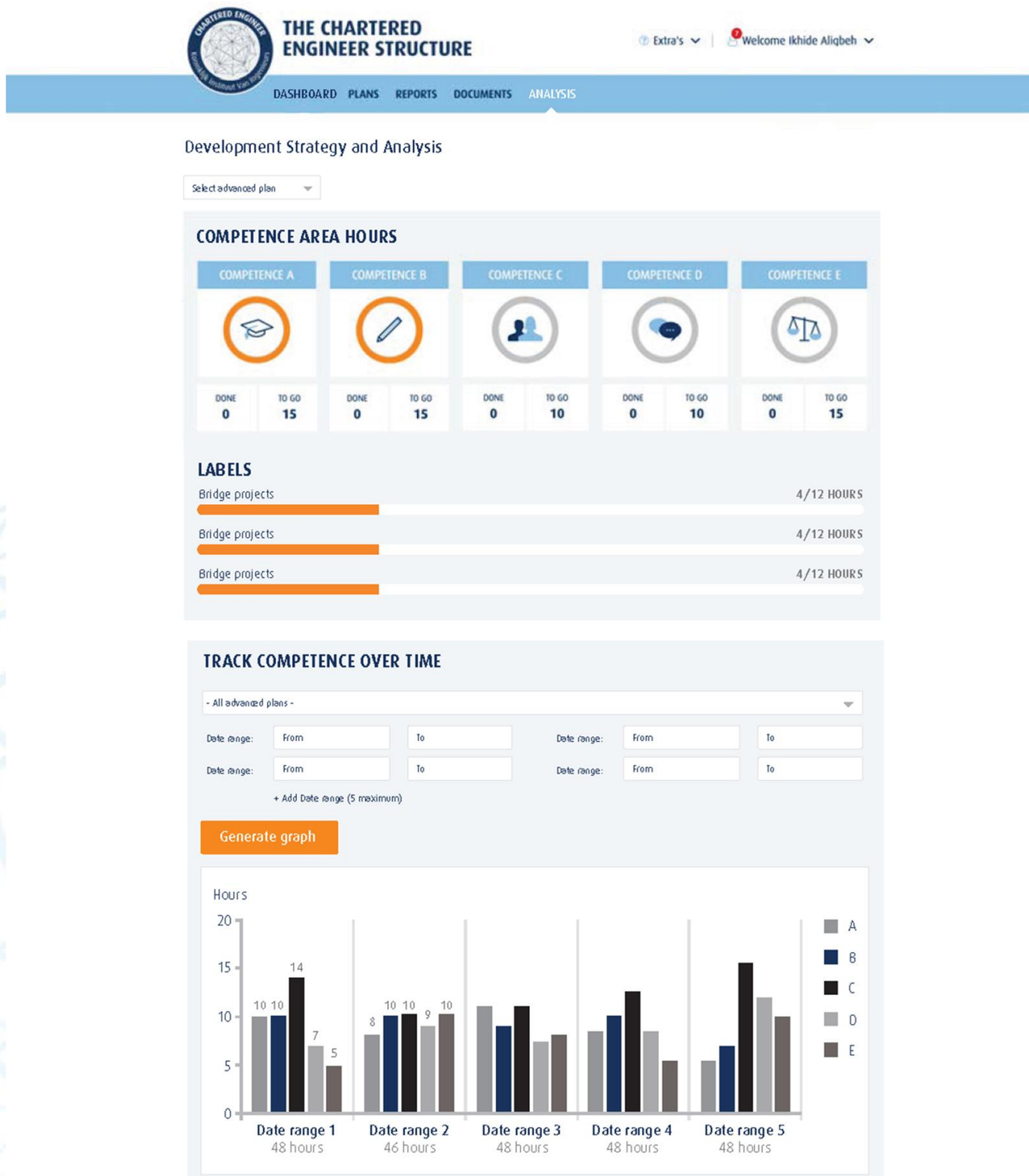
COMPLETED
22 tasks

COMPETENCE AREAS

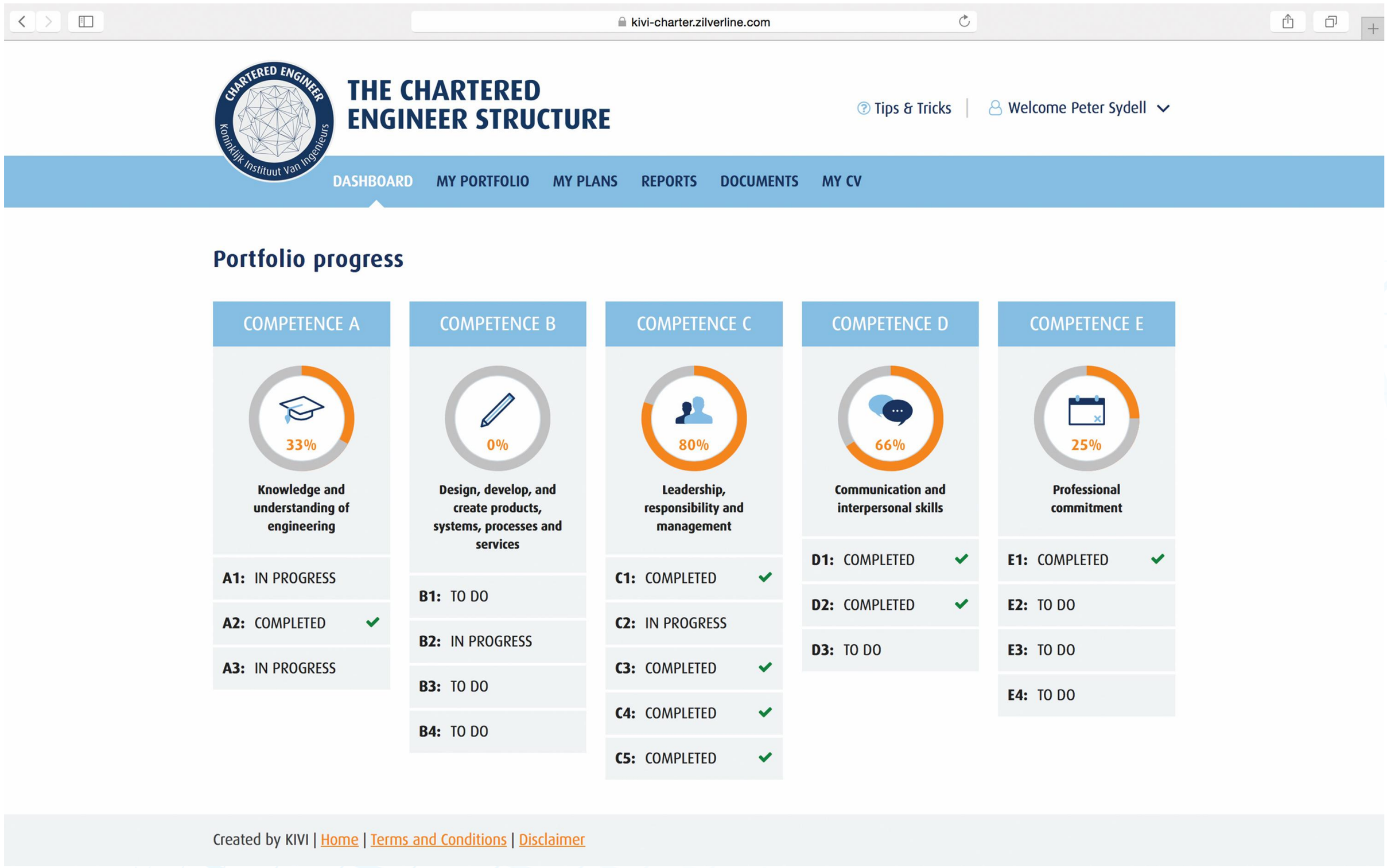
	HOURS	TASKS
A: Knowledge and understanding of engineering	50	9
B: Design, develop and create products, systems, processes or services	25	3
C: Leadership, responsibility & management	25	6
D: Communication & interpersonal skills	12	5
E: Professional commitment	20	6
TOTAL:	**132**	**29**
Not attributed:	0	1

TRACK COMPETENCE OVER TIME





ASSESSMENT PROCESS



PLANNING AND CPD TRACKING

THE OPD AND COMMUNITY

Since launching the OPD Tool:

Government

- Has requested the OPD Tool to be used across multiple sectors.

Industry

- Companies using the professional competences and the OPD Tool as a professional development path for their employees.
- Industry sectors using the professional competences and the OPD Tool for the advancement of the sector and the competence of their engineers.

Universities

- Students using the OPD Tool to prepare them for professional practice.
- Competence and outcome-based approach being incorporated into curriculum.

KEY ELEMENTS TO INNOVATION AND SUCCESS

- an eco-system between engineers from companies, government, with academia and students also involved;

- a framework for the continued learning path from students to professionals throughout their career, supporting all different roles and career stages;

- recognition to those who meet and keep a high professional standard through formal professional titles;

- an online support system to support individual learning and development as well as the overall process and structure;

MUTUAL RECOGNITION

- High end professional development framework
- with codified professional titles
- And a robust process in line with today’s digitization needs
- With analysis and reporting output
- Involving industry, government and academia
- Is an excellent base for mutual recognition between different countries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