

# Human Factors Professional Competency Checklist

A guide and decision-making tool for anyone interested in:

- Becoming a human factors professional.
- Increasing the breadth of their existing knowledge and skills.
- Measuring their competence against professional standards, now and as they develop.
- Supporting those already practicing, for example, a mentor or course provider.

Further use cases are given at the end.

## Overview

This Professional Competency Checklist (PCC) sets out the CIEHF's requirements for professional practice in human factors.

The basis of these requirements are **5 Core Competencies**.

These are fundamental to an understanding of human factors and its application. Everyone calling themselves a human factors professional should be able to demonstrate some level of knowledge, skills and abilities in each one.

## The 5 Core Competencies

- 1 Uses a human-centred approach to the design and development of systems.
- 2 Focuses on human characteristics, capabilities and limitations.
- 3 Recognises how other system components and performance influencing factors affects people.
- 4 Applies relevant methods, tools and techniques.
- 5 Adopts professional skills and behaviours.



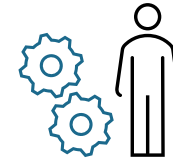
## First, some definitions

**Human factors** (also called ergonomics) is the scientific discipline aimed at understanding interactions between people and other elements of a **system**.

Human factors professionals have a range of **competencies** that allow them to apply theory, principles, data and methods to optimise human wellbeing and system performance.

They contribute to the design and evaluation of tasks, equipment, environments and systems to match them to the needs and abilities of people.

*Adapted from a definition by the International Ergonomics Association*



### System

A group of related things that work together as a whole.



### Competency

The ability of someone to apply an appropriate combination of essential knowledge and skills to perform a task. You can be deemed competent after training but without practice you can't become **proficient**.

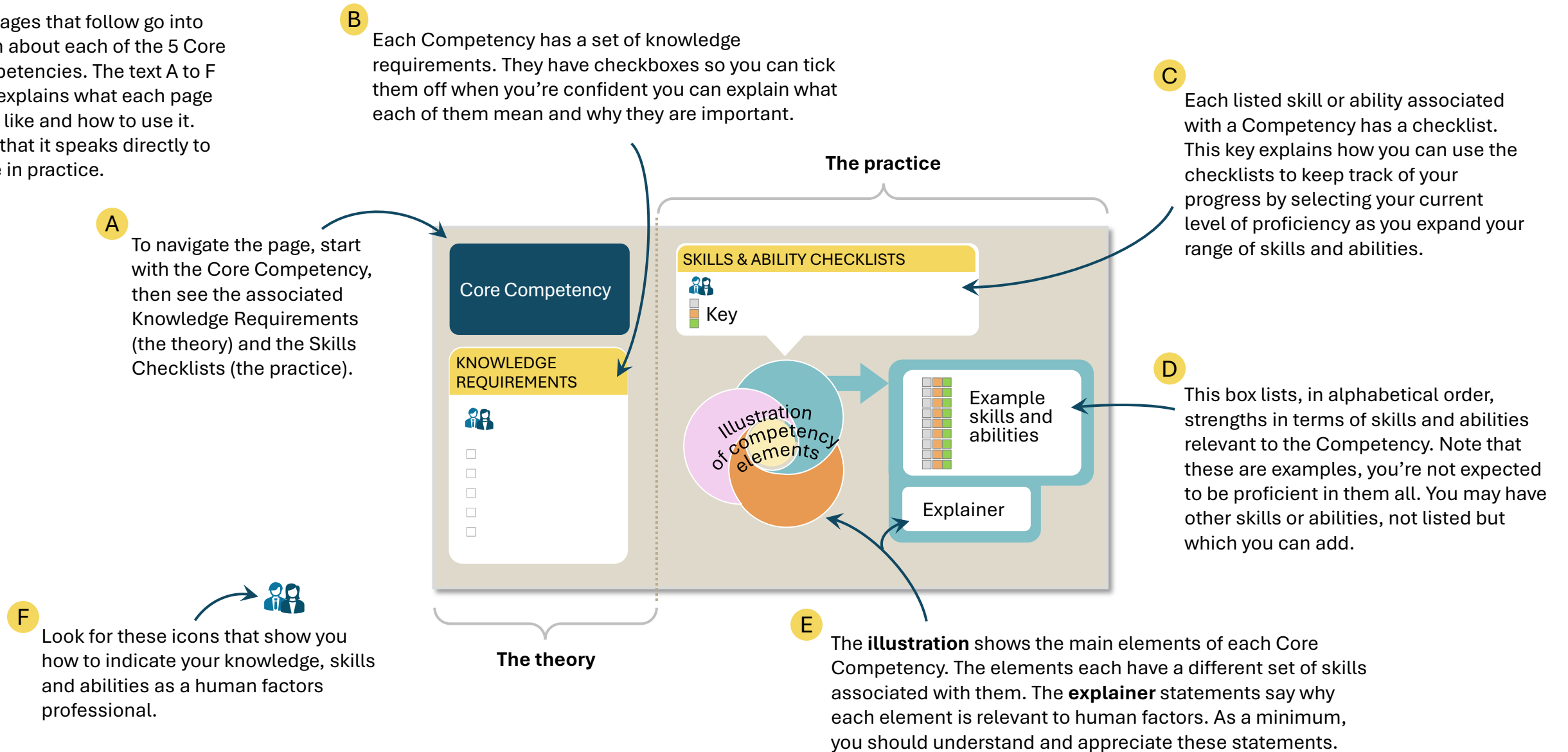


### Proficiency

Proficiency takes a certain mastery of learned skills and is developed over time, enabling decision making and technique to mature.

# The PCC format

The pages that follow go into depth about each of the 5 Core Competencies. The text A to F here explains what each page looks like and how to use it. Note that it speaks directly to those in practice.





## Core Competency 1

Uses a human-centred approach to the design and development of systems.

## KNOWLEDGE REQUIREMENTS



Tick these when you're confident you can explain what they mean and why they are important.

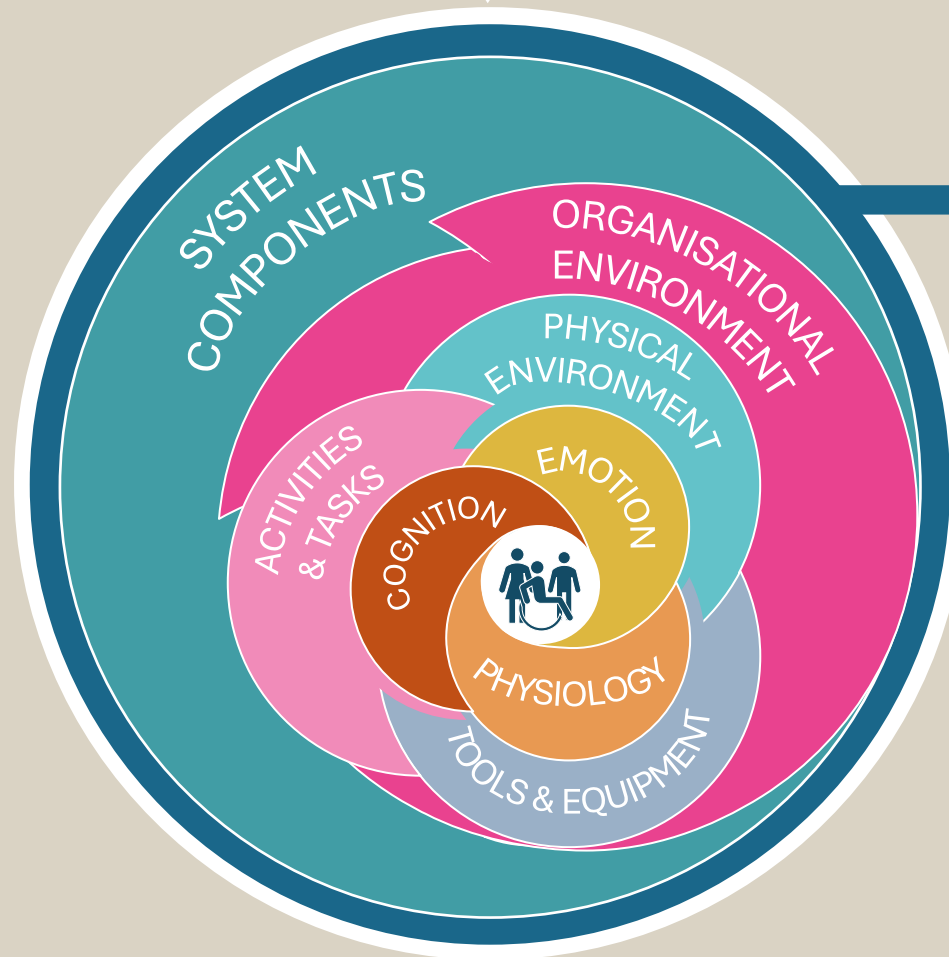
- 1.1 Specify indicators of a poor match between people and the other components of a system.
- 1.2 Recognise which aspects of a system or problem are amenable to human factors interventions.
- 1.3 Recognise that user participation can increase the quality of the outcome and promote acceptance.
- 1.4 Identify stakeholders, their inter-relationships, their needs and how to involve them.
- 1.5 Examine the role and application of human factors in optimising system performance.
- 1.6 Consult and collaborate with others as part of a multidisciplinary team.
- 1.7 Define user needs and evaluate how well those needs are met.
- 1.8 Identify practical constraints that affect change.

## SKILLS & ABILITY CHECKLIST



Tick items in the skills & ability checklist according to your strengths and level of proficiency, using the following key:

- ☐ RECALL: I know what this is but I have little or no experience of it
- ☒ EXPLAIN: I can explain key concepts and how they could be applied
- ☒ DEMONSTRATE: I can demonstrate practical application of this in my work



### EXPLAINER: What makes human factors effective

Human factors is a scientific, data-driven multi-discipline. It uniquely recognises that people are at the centre of a system which needs to be optimised for maximum safety, health, comfort and performance.

## HUMAN-CENTRED APPROACH

### MY STRENGTHS

Design for individuals v populations  
Design for maintainability  
Design for operability  
Human role in automation  
Human-centred interactions  
Iterative design & prototyping  
Participative, user-centred design  
Product design life-cycles  
Sociotechnical systems  
Use case specification  
User & target audience identification  
User experience  
User requirements capture  
Another skill or ability →



## Core Competency 2

Focuses on  
human characteristics,  
capabilities and limitations

### KNOWLEDGE REQUIREMENTS



Tick these when you're confident you can explain what they mean and why they are important.

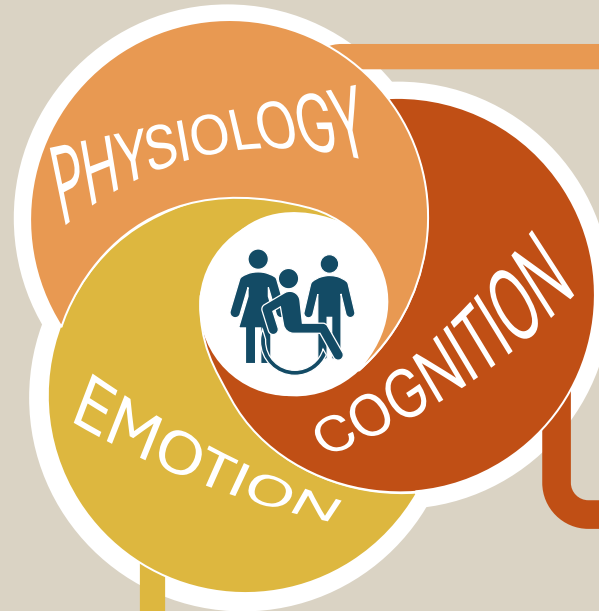
- 2.1 Recognise diversity and variability in physical, cognitive and emotional capability.
- 2.2 Understand how diversity and variability affects requirements, performance and risk perception.
- 2.3 Recognise the effect of psychosocial factors on someone's ability to function well.
- 2.4 Identify the attributes that influence and contribute to productivity and efficiency.
- 2.5 Understand the interplay of factors that affect safety, health and wellbeing.
- 2.6 Understand how functional anatomy and biomechanics determine human performance.

### SKILLS & ABILITY CHECKLISTS



Tick items in the skills & ability checklists according to your strengths and level of proficiency, using the following key:

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#### EXPLAINER: What people can physically do

People have different abilities that depend on their individual anatomy, physiology and physical attributes.

#### EXPLAINER: How people think

People think differently about the world depending on their lived experiences, psychology, neurodiversity and motivation.

#### EXPLAINER: How people feel

People feel differently about others and their surroundings depending on their background, past interactions and influences.

### PHYSIOLOGY

#### MY STRENGTHS

Ageing  
Anatomy  
Anthropometry  
Biomechanics & strength  
Circadian rhythms  
Ethnic variables  
Fatigue  
Gender variables  
Haptics  
Hearing  
Motion sensing  
Proprioception  
Vision  
Another skill or ability →

### COGNITION

#### MY STRENGTHS

Attention  
Decision making  
Distributed cognition  
Information processing  
Memory  
Neurodiversity  
Motivation & attitude  
Problem solving ability  
Situation awareness  
Vigilance  
Another skill or ability →

### EMOTION

#### MY STRENGTHS

Culture  
Empathy  
Stress  
Trust  
Wellbeing  
Another skill or ability →



## Core Competency 3

Recognises how other system components and performance influencing factors affects people

### KNOWLEDGE REQUIREMENTS



Tick these when you're confident you can explain what they mean and why they are important.

- 3.1 Identify, scope and define relevant task, equipment and environmental factors.
- 3.2 Identify and define demands on people.

### SKILLS & ABILITY CHECKLISTS



Tick items in the skills & ability checklists according to your strengths and level of proficiency, using the following key:

- ☒ RECALL: I know what this is but I have little or no experience of it
- ☒ EXPLAIN: I can explain key concepts and how they affect human performance
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#### EXPLAINER: What people do

People might carry out the same task in different ways, depending on their experience, distractions, time available, expectations placed on them and level of fatigue.

#### EXPLAINER: What people use

People may use equipment in different ways depending on their training, understanding of instructions, experience, strength, vision and reach capabilities.

#### EXPLAINER: Where people do things

People respond to environments in different ways depending on their physiology, personal protective equipment, amount of activity and level of concentration.

#### ACTIVITIES & TASKS

##### MY STRENGTHS

Complexity  
Duration  
Error potential & types  
Force  
Frequency  
Human reliability  
Manual handling  
Multi-tasking  
Posture (bending & twisting)  
Repetition  
Time constraints  
Workload  
Another skill or ability →

#### TOOLS & EQUIPMENT

##### MY STRENGTHS

Alarms, alerts & warnings  
Artificial Intelligence  
Controls & displays  
Hand tools  
Human computer interaction  
Human machine interaction  
Instructions  
Job aids & procedures  
Personal protective equipment  
Robots  
Safety systems  
Seating  
Workstations  
Another skill or ability →

#### PHYSICAL ENVIRONMENT

##### MY STRENGTHS

Access & egress  
Flooring  
Noise & acoustics  
Slips, trips & falls  
Thermal environment  
Ventilation & air quality  
Vibration  
Vision & lighting  
Workspace layout  
Another skill or ability →





## Core Competency 3

Recognises how other system components and performance influencing factors affects people  
(continued)

### KNOWLEDGE REQUIREMENTS



Tick these when you're confident you can explain what they mean and why they are important.

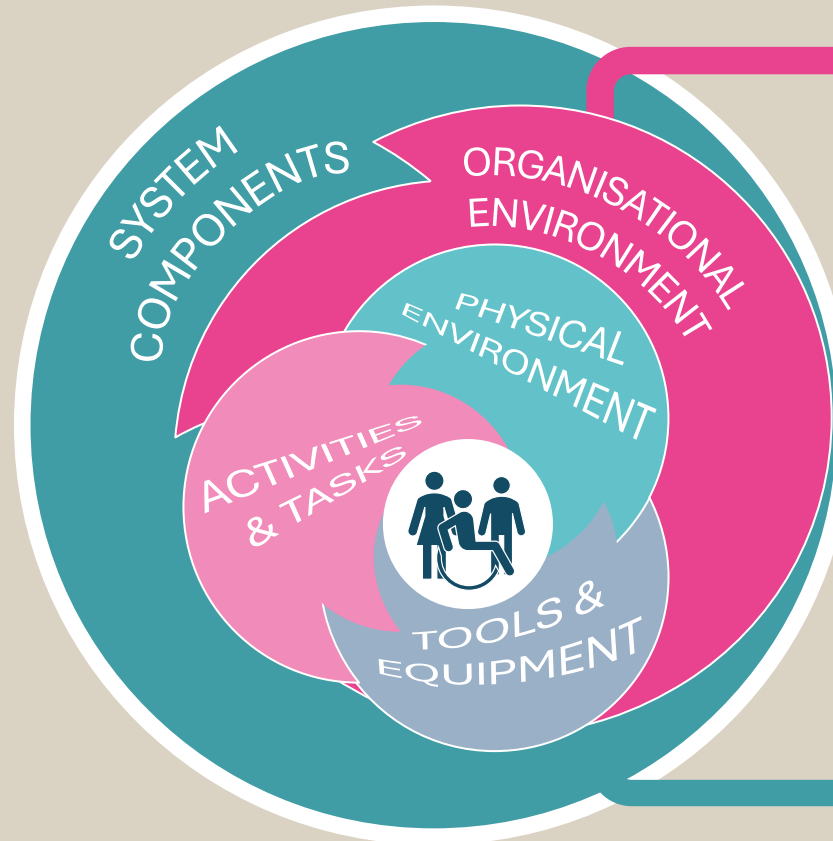
- 3.3 Identify and define organisational factors and how they affect individual and collective performance.
- 3.4 Recognise the limits of the effectiveness of training as a solution to a performance issue where the underlying cause is poor performance.
- 3.5 Identify the interactions between people and wider system components.
- 3.6 Recognise that systems may display characteristics and operate in ways not expected or intended.

### SKILLS & ABILITY CHECKLISTS



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#### EXPLAINER: How people interact with each other

People interact with others in different ways depending on their past experiences, prejudices, biases, familiarity, language, culture and comfort level.

#### ORGANISATIONAL ENVIRONMENT

##### MY STRENGTHS

Change management  
Climate & culture  
Communication methods  
Job roles & requirements  
Leadership & supervision  
Organisational learning & resilience  
Peer influence & group dynamics  
Shiftwork & rostering  
Staffing levels  
Teamwork  
Training & education  
Another skill or ability →

#### SYSTEM COMPONENTS

##### MY STRENGTHS

Accessibility  
Human error  
Incident investigation  
Job design  
Another skill or ability →

#### EXPLAINER: How parts of a system interact with each other

Everything humans interact with is part of a system and successful outcomes can be achieved through effective integration and learning from past experience.



## Core Competency 4

Applies relevant methods, tools and techniques.

### KNOWLEDGE REQUIREMENTS



Tick these when you're confident you can explain what they mean and why they are important.

- 4.1 Define the scope and locate sources of information relevant to a project.
- 4.2 Select appropriate methods, tools or techniques to gather information and data.
- 4.3 Use participatory methods to understand work as done rather than as imagined, written or described.

### SKILLS & ABILITY CHECKLISTS

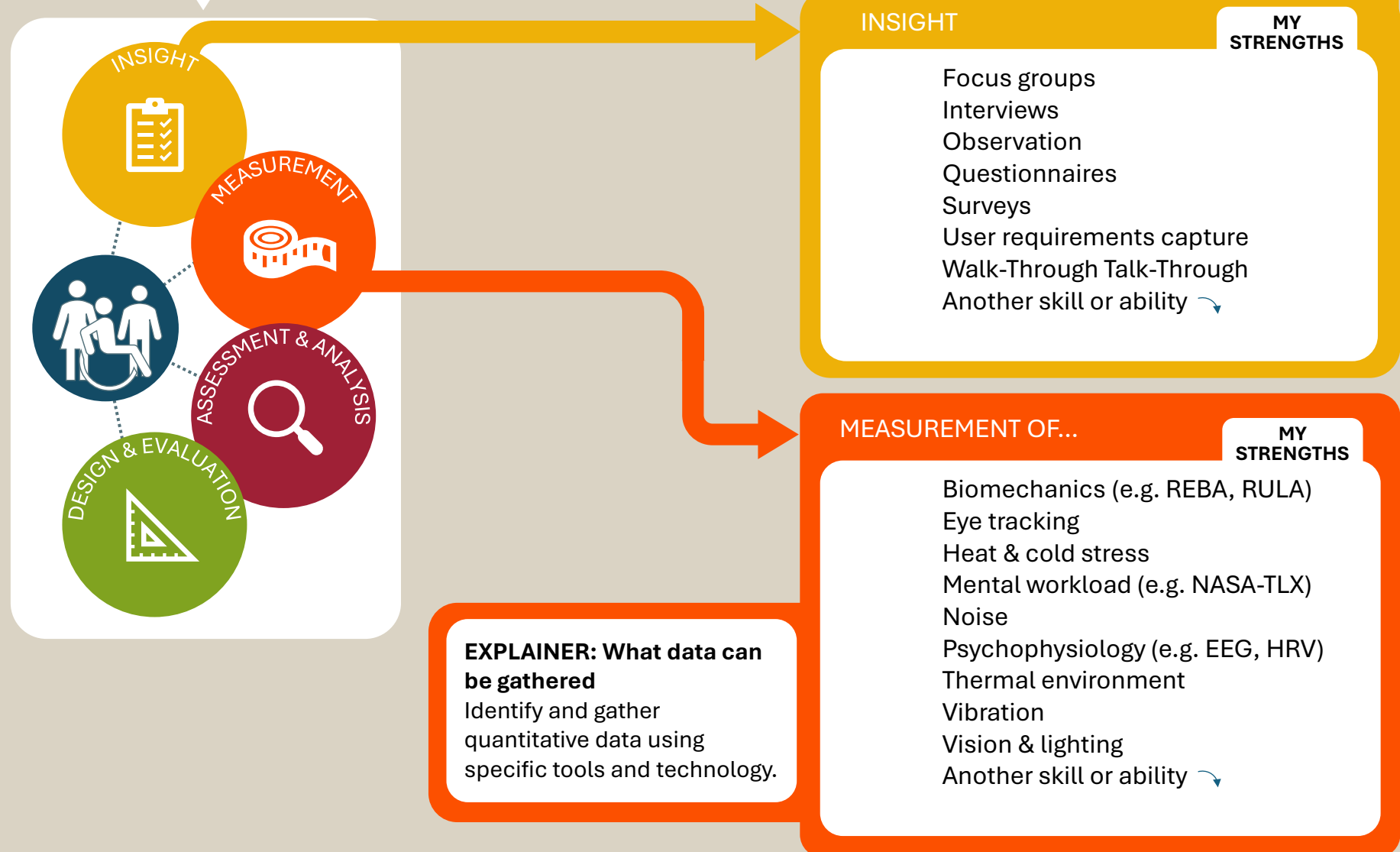


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#### EXPLAINER: What data can be gathered

Gain qualitative insight and understanding directly from those with experience.







## Core Competency 4

Applies relevant methods,  
tools and techniques.  
(continued)

### SKILLS & ABILITY CHECKLIST



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#### EXPLAINER: How data can be gathered and understood

Collect, examine and interpret information about interactions using purpose-built tools and methods.

### KNOWLEDGE REQUIREMENTS



Tick these when you're confident you can explain what they mean and why they are important.

- 4.4 Use a holistic approach to assessing work demands to understand the interplay between factors.
- 4.5 Assess individual, collective and organisational requirements.
- 4.6 Recognise the goals of risk assessment, control and management.
- 4.7 Identify and assess the nature and magnitude of each risk.
- 4.8 Interpret and analyse data and translate it into evidence-based recommendations.
- 4.9 Look for and consider options for solutions that optimise cognitive and physical demands on people.
- 4.10 Analyse alternative solutions based on the safety hierarchy of control.
- 4.11 Recognise where bias may influence results.



### ASSESSMENT & ANALYSIS OF...

MY  
STRENGTHS

Accessibility  
Accident & incidents (e.g. AcciMap, CIT, FRAM, HFACS, STAMP)  
Barrier management (e.g. Bowtie, LOPA)  
Cognitive tasks (e.g. CTA, VPA, WDA)  
Complex systems (e.g. allocation of function, EAST)  
Display Screen Equipment  
Fatigue  
Human reliability (e.g. CREAM, HEART, SHERP, THERP)  
Information flow  
Manual handling (e.g. MAC, NIOSH)  
Repetitive tasks (e.g. ART)  
Root cause  
Situation awareness (e.g. SART)  
Sociotechnical systems (e.g. SEIPS, MAS, MEAD)  
Stimulus-response compatibility  
Tasks (e.g. HTA, SCTA, VPA)  
Technology integration (e.g. HITOP)  
Training (e.g. TNA)  
User experience  
Workload (e.g. EMG, SWAT)  
Another skill or ability →



## Core Competency 4

Applies relevant methods,  
tools and techniques.  
(continued)

### SKILLS & ABILITY CHECKLIST



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### KNOWLEDGE REQUIREMENTS



Tick these when you're confident you can explain what they mean and why they are important.

- 4.12 Seek enhancements to system components and design in preference to behaviour change.
- 4.13 Apply an iterative approach to design until an acceptable solution is found.
- 4.14 Provide design specifications and guidelines based on analysis of findings.
- 4.15 Optimise integration of human factors elements with other system components.
- 4.16 Select appropriate criteria for user acceptance and satisfaction.
- 4.17 Critically evaluate how well user needs are met, judging the quality and effectiveness of interventions, using success metrics.
- 4.18 Recognise unanticipated outcomes of an intervention or design process.



**EXPLAINER:** What data can be used for Investigate and develop solutions to design issues and evaluate their effectiveness.

#### DESIGN & EVALUATION OF...

#### MY STRENGTHS

Functional anthropometry  
Interfaces (e.g. heuristics)  
Layouts and sequences (e.g. link analysis)  
Simulations & prototyping  
Universal design  
Usability (e.g. cognitive walkthrough, trials)  
User acceptance  
User modelling  
Workspace (e.g. biomechanical modelling)  
Another skill or ability →



## Core Competency 5

Adopts professional skills and behaviours.

### KNOWLEDGE REQUIREMENTS



Tick these when you're confident you can explain what they mean and why they are important.

- 5.1 Show rational, critical, logical and conceptual thinking.
- 5.2 Find and advise on relevant legislation, standards, guidelines and best practice.
- 5.3 Interact effectively with stakeholders regarding analysis and interpretation of findings.
- 5.4 Justify intervention strategies, rationale, realistic outcomes, limitations and cost-benefit.
- 5.5 Plan implementation and evaluation of changes to maximise potential for system improvement.
- 5.6 Provide clear, concise, accurate and meaningful records and reports.
- 5.7 Communicate findings appropriate for the audience and provide motivation to act.
- 5.8 Recognise the need to learn and gain insight from other human factors professionals.
- 5.9 Show commitment to lifelong learning.

### SKILLS & ABILITY CHECKLIST



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#### EXPLAINER: How my knowledge, skills, experience and behaviour impacts others

Human factors has an extensive reach, and I must work within my proven competencies whilst always aiming for increased proficiency.

#### PROFESSIONAL PRACTICE

##### MY STRENGTHS

Collaborative problem solving  
Communication about human factors impact  
Contextual interpretation of results  
Effective Continuous Professional Development  
Effective leadership  
Mentoring  
Ethical practice  
Following the Code of Professional Practice  
Knowing my limitations  
Project planning and design  
Stakeholder inclusion & management  
Another skill or ability ↪

# Acronyms

These are used in Core Competency 4:  
methods, tools & techniques

ART	Assessment of Repetitive Tasks
CIT	Critical Incident Technique
CREAM	Cognitive Reliability and Error Analysis Method
CTA	Cognitive Task Analysis
EAST	Event Analysis of Systemic Teamwork
EEG	Electroencephalography
EMG	Electromyography
FRAM	Functional Resonance Accident Model
HEART	Human Error Assessment and Reduction Technique
HFACS	Human Factors Analysis Classification System
HITOP	High Integration of Tech, Organisation & People
HRV	Heart Rate Variability
HTA	Hierarchical Task Analysis
LOPA	Layers of Protection Analysis
MAC	Manual handling Assessment Charts
MAS	Macroergonomic Analysis of Structure

MEAD	MacroErgonomic Analysis & Design
NASA-TLX	NASA Task Load Index
NIOSH	National Institute for Occupational Safety and Health Lifting Equation
REBA	Rapid Entire Body Assessment
RULA	Rapid Upper Limb Assessment
SART	Situation Awareness Rating Technique
SCTA	Safety Critical Task Analysis
SEIPS	Systems Engineering Initiative for Patient Safety
SHERPA	Systematic Human Error Reduction & Prediction Approach
STAMP	Systems Theory Accident Modelling and Process
SWAT	Subjective Workload Assessment Technique
THERP	Technique for Human Error-Rate Prediction
TNA	Training Needs Analysis
VPA	Verbal Protocol Analysis
WDA	Work Domain Analysis

## Examples of use cases

Look at these to see which parts of the PCC might help you, depending on your needs.



**I want to get a clearer picture of the breadth of human factors:** Look at the competencies, skill areas and range of methods, tools & techniques.

**I want to check whether my organisation would benefit from the services of a human factors professional:** Look at the skill areas and the methods, tools & techniques to see if any of them match what you might need.

**I want some ideas for requirements to include in job descriptions:** Look at the competency knowledge lists.

**I want to identify whether certain courses would benefit my development:** See how well the course learning outcomes match the competency knowledge lists.

**As a provider, I want to ensure my course covers relevant human factors learning:** Check your course learning outcomes and content against the competency knowledge lists and skill areas.

**I want some help with my continuing professional development:** Use the checklists to assess your knowledge and levels of proficiency and look for gaps you can fill and areas to improve.

**I want some input into mentoring:** Go through the competency knowledge, skill areas, and methods, tools & techniques to spot strengths and opportunities for improvement.

**I want to input into my employment appraisals:** Use the checklists to help set objectives, to highlight your strengths and to look for opportunities for future development.

**I want to assess my eligibility for CIEHF professional membership grades:** Ensure you can check off the majority of the knowledge requirements. Check your proficiency levels in the skills and attributes match or exceed the minimum criteria as set out in the assessor rubric.