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Enterprise Resilience:

Playbook for Organisations

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Project Leads:
Dr Martin LEO and Prof Lawrence LOH

Project Team:
Rishav CHAKRAVERTY
LIM Jun Ting Lionel
OR Yu Qing
WONG Kwang Chung Andre
YIN Jiajun

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Prof Lawrence LOH | Ms Verity THOI | Ms ANG Hui Min

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ormc@nus.edu.sg
cgs@nus.edu.sg

Preface

This playbook delves into the multifaceted concept of enterprise resilience, encompassing its definition, integration with the risk management lifecycle, the cultivation of a resilient culture and metrics to measure it. It is designed to present a comprehensive framework for enterprise resilience.

With the traditional perspective of organisational resilience associated with risk management measures and the reactivity to complexities to maintain business continuity, the modern landscape depicts it as a more comprehensive, thorough preventive approach that encompasses numerous dimensions—from operational to people resilience, and diverging further into the digital means of resilience incorporation. The amalgamation of all such departments keeps diverse teams in organisations agile and dynamic in the face of unforeseen changes.

By following the actionable and measurable steps outlined within, organisations can systematically enhance their ability of building long-term resilience that extends beyond mere business continuity, withstand and thrive amidst various challenges.

Executive Summary

Click on the orange boxes to find out more.

Enterprise Resilience

can be defined to be an enterprise's ability to be agile in its response to possible disruptive events, by changing and adapting its strategy, processes, technology and personnel.

comprises of:

Operational Resilience

involves establishing an effective framework with clearly defined roles to maintain key business functions during disruptions.

Technological Resilience

helps organisations tackle disruptions, as well as ensures uninterrupted service delivery to its end users.

Digital Resilience

as an increasingly vital pillar in a rapidly transforming digital landscape, enabling quick adaptation to disruptions and maintaining competitiveness.

Financial Resilience

focuses on the organisation's ability to withstand economic shocks and invest in growth, often led by the Chief Financial Officer, in relation to financial sustainability.

People Resilience

equips an organisation with human resources to ensure effective execution by interconnecting different aspects of the enterprise resilience structure.

When read together, these resilience pillars enable organisations to navigate challenges and thrive in challenging business environments.

Why is this important?

Management Lifecycle

Enterprise resilience can be manifested in its risk management lifecycle which should evolve and move away from the traditional methods. It comprises of the following four stages:

Identification

leverages on the use of predictive analytics, scenario planning and real-time data feeds while viewing risks being interconnected and the responsibility of the entire organisation.

Assessment

integates dynamic factors such as risk velocity and risk escalation potential into the creation of a vulnerability map alongside stress tests.

Mitigation

adapatable through agile decision making and clear escalation protocols. Organisations should strive to collaborate with both its internal and external stakeholders.

Monitoring

should be enhanced using technology such that the derived insights can contribute to creating strong and continuous feedback loops to support the cycle.

With the four stages with enterprise resilience built into their core, the integration of these continuous processes into its operations would position the organisation in a better standing to not only able to survive but thrive.

Building a culture of resiliency

Building resilience in organisations requires fostering a profound culture through leadership, transparent communication and inclusivity. Managers and key personnel modelling resilient behaviours can improve employee morale and encourage collaboration across teams in order to drive problem solving and flexibility.

Actionable steps by leaders to embed culture

Continuous learning, regular training and clear SOP re-structuring equip employees with crisis management skills, focusing on their adaptability and capacity to hurdle through disruptions. Establishing resilience-specific metrics and reward systems will work towards motivating employees to integrate resilience into their daily tasks.

Creating an effective governance structure

The basis for this comprehensive approach lies in an effective governance structure that ensures employees remain agile, develop the innate capacity to tackle uncertainties and are prepared to thrive amidst challenges.

Measuring the resiliency of an organisation

Measuring enterprise resilience is crucial for organisations to assess their vulnerability to disruptions, their flexibility in adapting to changes, and their effectiveness in recovery. Different organisations face varying levels of impact from disruptive events, so resilience must be assessed across multiple aspects, such as operational, financial, and people resilience.

Ways to measure:

Operational Resilience and Technological Resilience

Recovery time and the level of recovery could be used as two metrics. While recovery time measures the duration in terms of man-hours, or in severe disruptions, man-days, from the point of which disruption occurs, the level of recovery measures the impact taken to restore core services to a minimum viability, or at a business-as-usual level.

Digital Resilience

can be measured by uptime of the organisation's systems, customer satisfaction and retention in relation to the organisation's digital capabilities.

Financial Resilience

can be measured by several metrics, such as Cash Buffer Days, Debt Ratio, Current Ratio, and other metrics that individual organisations may find most relevant for their needs.

People Resilience

should be measured by customised employee self-assessments to gain a more accurate and personalised understanding of workforce resilience, given its subjectivity and varying needs across industries.

A combination of these metrics, as well as others that an organisation may consider relevant to its goals and objectives, will provide a holistic measurement and view of its overall enterprise resilience.

An organisational checklist for resilience

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01 Introduction to Enterprise Resilience

Enterprise resilience can be defined to be an enterprise's ability to be agile in its response to possible disruptive events, by changing and adapting its strategy, processes, technology and personnel.

Today, organisations across industries operate in a very different world than they once did. They face heightened challenges that test their resilience in today's **VUCA** (Volatile, Uncertain, Complex, Ambiguous) environment which further emphasises on the importance of enterprise resilience.

Agile refers to being quick to adapt and make changes.

V

Volatile

Poses difficulties for organisations to keep up and anticipate (such as rapid technological advancement).

U

Uncertain

Requires decisions to be made with limited information while anticipating a range of different outcomes (such as global economic conditions).

C

Complex

Calls for sophisticated decision-making processes as well as the ability to manage multiple variables simultaneously (such as the interconnected global supply chains).

A

Ambiguous

Driven by conflicting information and unclear outcomes which tends to complicate decision making processes (such as ventures in emerging markets).

Notably in recent years, unexpected external challenges such as the novel coronavirus (COVID-19) pandemic, drastic climate changes and regional geopolitical tensions have also accelerated the trend and the need to establish systematic enterprise resilience. For instance, during the COVID-19 pandemic, companies like Zoom and Amazon thrived due to their adaptable business models and robust digital infrastructures, which allowed them to quickly pivot and meet new demands. Conversely, many traditional brick-and-mortar retailers struggled or even went out of business because they lacked the flexibility and preparedness to handle such a sudden shift in consumer behaviour.

This also marks a significant pivot from the reactive approaches of the past where organisations primarily focused on basic risk management practices and addressed problems as they arose. They have since then evolved to take on a more proactive and preventive approach which involves integrating resilience into core functions with the aim not only to survive but to thrive.

As such, the once narrowly scoped concept of Enterprise Resilience has since expanded to encompass various dimensions of risks such that organisations are able to continue to deliver value even in times of disruptive events. This includes operational resilience, financial resilience, technological resilience, digital resilience and people resilience.

02

Corporate Taxonomies for Enterprise Resilience

In today's fast-paced and unpredictable business environment, the internal capability of an organisation to adapt and recover swiftly has become a crucial step towards success. Organisations prioritising agility and proactive risk management are better positioned to thrive in the face of unforeseen circumstances. The growing focus on related fields has ensured that companies are steadfast, whilst seizing opportunities for their development and growth, even amidst external disruptions.

Operational Resilience

Operational resilience refers to an organisation's overall ability to withstand unexpected disruptions by utilising its resources such as people and techonology, It requires organisations to establish a governance framework to timely respond to such events. The following identification-testing-reflection structure could aid the organisation to incorporate the missing elements in its existing operational resilience framework to better understand its business and adjust the recovery mechanism to minimise the impact of delivery of its core services.

Identification

Testing — Entire end-to-end delivery of its core business functions rather than separate business segments

Reflection — Interconnections of its different activities to assess its overall operational resilience

While operational resilience addresses the need for an overall framework, **financial resilience** refers to the organisation's ability to carry out its income-generating activities. It directly reflects the organisation's financial performance, the ability to withstand economic shocks and the ability to invest in growth opportunities. Existing stages of establishing financial resilience could be categorised into three stages, namely anticipation, response and recovery, which aligns with the operational resilience framework mentioned earlier on.

Financial Resilience

The central role of maintaining an organisation's financial resilience is usually taken up by the Chief Financial Officer who oversees the enterprise's performance by adjusting the financial strategies. However, financial resilience should not be viewed in isolation as it is closely related to other aspects of enterprise resilience.

Technological Resilience

Technological resilience refers to implementing an advanced technological system as well as equipping the employees with necessary knowledge and skills so that they are familiar with the techonology infrastructure and be prepared to tackle technological challenges.

Digital Resilience

Refers to an organisation's ability to handle disruptions, especially cyber disruptions, as well as delivery of digital services, by leveraging digital capabilities.

While technological resilience emphasises on achieving an overall robustness within the organisation by acquiring new technologies such as data centres and peripheral devices, digital resilience focuses more on the quality of digital services through the organisation's value chain. It involves both external and internal stakeholders.

Digital Resilience

External Stakeholders

Customers
Maintain accessibility of digital services provided to customers during cyber disruptions

Regulators
Follow the digital guidelines provided by the authority to timely refurbish the digital system.

Internal Stakeholders

Management
Make sure the organisation maintains digital security to handle cyber threats.

Employees
Be informed about potential events such as cyberattacks that may adversely affect the digital services.

People Resilience

Various aspects of enterprise resilience are interconnected, creating complexity for organisations in implementing a systematic resilience framework. This challenge highlights the importance of **people resilience**, which refers to an organisation's ability to optimise its talent resources to connect various aspects of enterprise resilience.

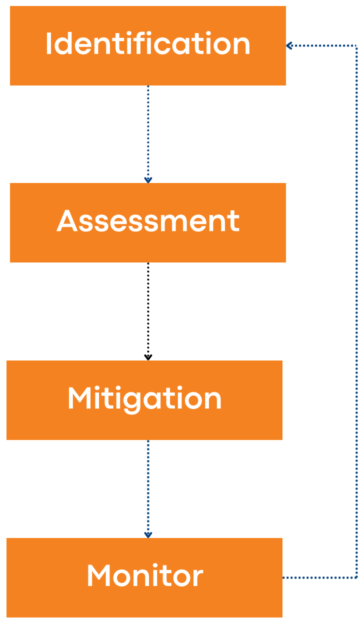
Prioritising people resilience is key to enhancing enterprise resilience, where the leaders are expected to exhibit resilience as role models to other members within the organisation.

After assessing the individual behaviour and performance during the scenario-tests, the organisation would gain better understanding of its members' adaptability to the changing environment. It could then provide relevant support to equip its members with necessary skills to boost the overall enterprise resilience.

03 Management Lifecycle

To build resilience into the core of the organisation, organisations should transform risk management into a continuous, holistic strategy that enhances enterprise resilience against both anticipated and unforeseen challenges. Viewing resilience through the lens of the life cycle allows organisations to systematically address vulnerabilities and enhance their capacity to withstand and thrive amidst challenges.

Given that resilience is built over time through ongoing risk management efforts, it is also essential that the following four steps are not performed as isolated or periodic activities, but as continuous processes integrated into daily operations which aligns with company goals and priorities.



Identification

Traditional risk identification approaches: What are their limitations?

Traditional risk identification often relies on a systematic discovery of potential risks. Organisations would scan their operational landscape to pinpoint potential vulnerabilities through methods such as checklists, surveys or inspections. While effective in many respects, organisations tend to only be able to identify risks that are known and historically materialised. Therefore, new or emerging risks may be potentially overlooked, affecting enterprise resiliency. This limitation can significantly impact enterprise resilience, as unforeseen risks can disrupt operations and strategic objectives.

Enhancing risk identification: How can we leverage on other tools?

To strengthen enterprise resilience in a rapidly changing risk landscape, organisations should leverage on the use of predictive analytics accompanied by scenario planning and real-time data feeds to transform risk identification into a forward-looking process that strengthens enterprise resilience. Organisations would also be able to sieve out patterns and correlations related to potential risks that may not be evident to human analysts.

→ Real-time Data Feeds

Provides immediate insights into evolving conditions that can impact operations. Examples include financial market data, social media sentiment analysis, cybersecurity threat intelligence, weather and environmental data.

→ Predictive Analytics

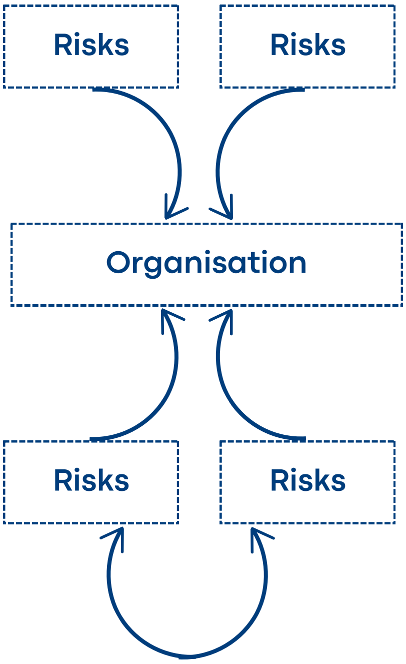
Uses backwards-looking historical data as a starting point to train datasets in identifying patterns. At the same time, the analytics system remains adaptable through the continuous input of new, real-time data.

This allows organisations to move beyond the limitations of historical insights, enabling a more proactive stance where risks can be anticipated and addressed before they fully materialise.

→ Scenario Planning

Aids organisations in exploring the wide range of possible future scenarios and their associated risks.

This helps organisations to not be fixated on a single forecast but rather be able to consider unlikely but impactful events.



Moving beyond siloed approaches: Who should be responsible?

The focus should shift from isolated risks to viewing risks being interconnected across the entire organisation's ecosystem. The siloed approach where risks are being categorised separately for different departments or functions would only result in a fragmented understanding of risk and therefore, ultimately failing to recognise or address risks that span across multiple areas of the organisation. Hence, an interconnected perspective is crucial for building a resilient organisation that can withstand and adapt to complex challenges.

As such, identification should not only be the responsibility of a sole centralised team. Engaging employees at all levels from the start of the management lifecycle is essential. Involving a broader range of inputs helps surface risks that might be overlooked by a centralised team, fostering a culture of resilience throughout the organisation. This inclusive approach ensures that resilience is embedded in the organisational fabric, enhancing the ability to navigate and thrive amidst uncertainties.

Assessment

Traditional risk assessment: Is it enough for today's environment?

Typically, risk assessment is traditionally focused on evaluating and prioritising risks based on their likelihood of occurrence and their potential impacts, both short- and long-term.

Though it helps organisations to understand the severity of risks, it often lacks a dynamic perspective which is essential in today's rapidly changing environment.

How can we integrate dynamic factors into risk assessment?

Risk velocity

refers to the timeframe within which the risk can materialise and impact an organisation.

Risk escalation potential

refers to the likelihood that a risk will increase in severity and impact, resulting in larger and more complex problems.

The addition of risk velocity and risk escalation potential allows effective prioritisation of risks that not only pose immediate threats but also have the potential to rapidly cascade across the organisation. This ensures that resources are effectively allocated to risks that could compromise the organisation's resilience if left unaddressed.

Risk velocity: Why does it matter? How do we measure it?

- Very High: Less than a Day
- High: Days to Weeks
- Medium: Weeks to Months
- Low: Months to a year
- Very low: Over a year

When the velocity is low, organisations would have more time to intervene and mitigate as compared to risks with a high velocity that leaves little time for response. Therefore, recognising the high-velocity risks is crucial for maintaining enterprise resilience as it can trigger faster decision-making and more urgent resource allocation.

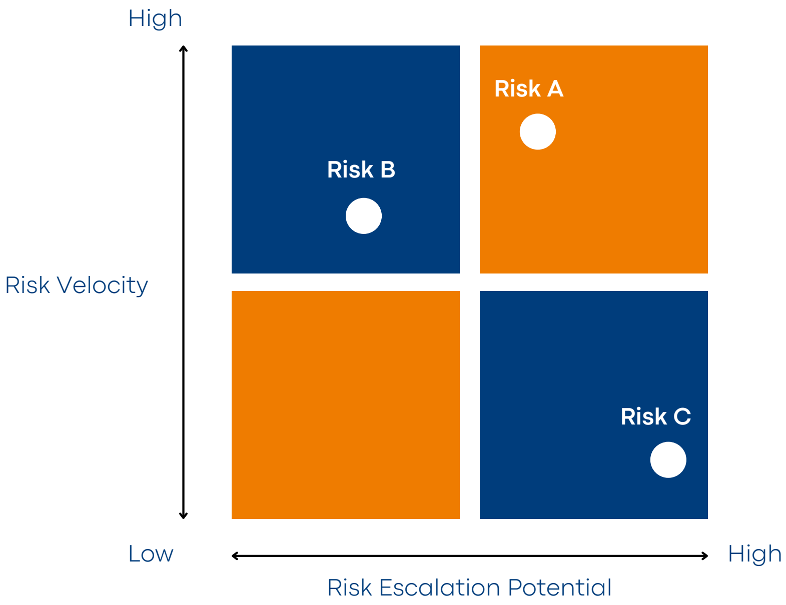
This can be achieved through the usage of real-time data feeds, continuous monitoring systems and early warning indicators, enabling a proactive stance in reducing the window of opportunity for the risk to cause significant harm. Indicators of risk velocity could be measured by a velocity scale to triage and classify them.

Risk escalation potential: How can one risk trigger a domino effect?

It is essential to assess not only just the initial impact of a risk but also its ability to trigger a domino effect in terms of scale and severity. This involves recognising the interdependencies between risks whereby one risk can trigger or amplify others. Thereafter, strategies can be formulated to mitigate the initial risk and prevent the cascade of subsequent risks.

What can organisations do to further enhance risk assessment?

Incorporating risk velocity and escalation potential through advanced scenario analysis and simulations enables organisations to build flexible response strategies.



This prepares organisations for a broad range of outcomes, enhancing enterprise resilience by equipping them with the capability to manage cascading risks in complex environments. Thereafter, a vulnerability map can also be created by assigning scores to the two aspects, with a greater value indicating a greater threat and risk posed.

Stress tests can also be adopted to simulate severe but plausible disruptions. This would help to challenge the organisation's current planning assumptions and ensure the relevance and effectiveness of its contingency plans, to better mitigate the impact of severe disruptions. As part of the stress tests, the organisation should also track and monitor key indicators that are used to measure the aspects of enterprise resilience which would be explored in greater detail in Chapter 5.

By adopting these comprehensive risk assessment strategies, organisations can significantly enhance their resilience, ensuring they are better prepared to navigate and thrive amidst uncertainties.

Mitigation

Why is flexibility key in risk management?

Instead of relying on fixed plans, organisations should strive to develop flexible and adaptable mitigation strategies that allow for rapid adjustments in response to changing circumstances. Enterprise resilience tends to thrive on the ability to absorb shocks and continue operating, albeit not at full capacity, and adaptive mitigation is key to maintaining this operational continuity.

How does agile decision making strengthen mitigation efforts?

Agile decision-making processes that empower teams to act swiftly in crisis situations are essential to organisational resilience. By enabling rapid, decentralised responses, organisations can mitigate risks more effectively and maintain enterprise resilience, even under rapidly changing conditions.

What role do escalation protocols play in risk mitigation?

In line with assessing the risks' ability to escalate, organisations should also have clear escalation protocols in place so that emerging issues can be communicated effectively and efficiently to the relevant or higher authorities at the appropriate junctures. This includes identification of the personnel to escalate issues to (which is based on their roles), when to escalate as well as a clear escalation report which entails a summary of the risks, causes, effects and status. This would enable the appropriate actions to be taken to prevent further deterioration, thereby enhancing enterprise resilience.

Why should organisations also collaborate with external stakeholders?

Given that organisations are not isolated entities, apart from managing their internal stakeholders, organisations should also work with their external stakeholders such as their business partners and suppliers to address and mitigate shared risks. Regular communication and coordination, including conducting joint tests, could help to ensure that all parties are aligned and can respond cohesively to any threats. This collaborative approach not only mitigates risks more effectively but also strengthens the overall resilience of the organisation by fostering a unified response to disruptions.

Monitor

How can technology enhance risk monitoring?

Organisations can leverage on technology such as the Internet of Things (IoT), artificial intelligence and machine learning to monitor in real time and detect early warnings of risks. This data-driven approach can be translated to dynamic dashboards that offer real-time visibility into the key risk indicators at one glance, accompanied with the ability to drill down into specific areas for deeper analysis.

Why are feedback loops essential in risk monitoring?

Insights derived from this stage would also be essential in creating strong and continuous feedback loops to support the other stages of the risk management lifecycle, leading to a more integrated and responsive risk management process. These feedback loops ensure that lessons learnt from past incidents and emerging risks are continually integrated into the organisation's risk management framework. This iterative process strengthens enterprise resilience by continuously refining the organisation's understanding and response to risks.

In summary,

This chapter emphasises a proactive risk management approach that integrates risk processes into daily operations to enhance resilience. It advocates for collaboration across all levels, moving away from siloed methods, and using modern tools, such as predictive analytics. This flexibility helps organisations anticipate and respond to risks effectively in a rapidly changing environment.

04 Fostering Culture Development and Organisational Growth

Culture development is crucial for developing organisational resilience and incorporates various factors that will allow organisations to adequately react to upcoming threats and disruptions in their respective work environments. Embedding such practices into the very core of the organisation will allow them to recover, adapt and overcome any unfavourable conditions.

- Resilience in leadership
- Fostering an inclusive workplace
- Effective Governance Structuring
- Resilient workplace behaviour and culture
- Resilience in reward systems
- Innovative and adaptable work culture
- Improving communication practices

How should leaders prepare their organisations to be resilient?

Articulating a clear vision and commitment. Leaders are to articulate a clear, concise vision that aligns with organisational goals and resilience strategies through clear communications. This highlights managements' unwavering commitment towards fortifying dedication amongst teams.

Role modelling. Leaders need to exhibit resilient behaviours, maintain their composure during disruptive events, promote innovative workplace environments and set a distinct standard for employees to follow. Staying calm under such high-pressure situations can spur a culture of resiliency, shaping the employees' attitudes towards the strategic goals of the organisation.

Providing employee empowerment and aid. Employees need to be actively involved in decision-making and be provided the appropriate channels to voice their opinions. This would foster a sense of responsibility as they engage in high-priority duties towards facilitating resilient work practices. Granting the resources and training capabilities would proactively lead to the integration of a resilient workplace culture.

How could leaders foster an inclusive workplace, when building resilience?

Leading cross-functional teams. With the diversity in employee demographics and backgrounds, they contribute through their unique functions and expertise. This enhances problem-solving capabilities within teams as resilience development emphasises collaboration, considering various angles and perspectives when unforeseen circumstances occur.

Promoting inclusivity. By fostering a sense of belonging and ownership, this leads to more informed choices and strengthens the employees' commitment towards organisational resilience efforts.

Setting actionable plans. Having clear and transparent communication channels builds the bedrock for trust and psychological safety, where employees are comfortable sharing, expressing and taking calculated risks. Organisations that prioritise such culture benefit through fostered trust and open communication across channels.

How could leaders improve communication practices?

Creating transparency. Transparent channels of communication would allow for a two-way flow of information across various levels in the organisation. Practices such as regular updating and insight-sharing platforms, coupled with a timely facilitation and user interface would allow employees to be operationally aware, ensuring alignment and cohesion with the resilient strategies in times of need.

Proactively prepare for times of crisis. Creating pre-defined roles and responsibilities, messaging channels and strategies would ensure no cases of misinformation and uncoordinated responses. Having practice scenarios to familiarise employees with the various communication strategies would better prepare the workforce with this resilience framework as they grasp the right steps to respond effectively amidst a crisis.

Ensuring two-way feedback. The ability to provide feedback for actionable steps will make employees feel valued. Open dialogue, anonymised surveys and regular feedback sessions will promote the cause of a more communicative workplace culture.

How should leaders transform workplace cultures & behaviours?

Providing training and education. Strengthening resilience through regular training programmes aimed at the up-skilling of employees, while focusing on aspects such as crisis management, adaptability and stress management, can benefit organisational resilience. Providing opportunities to apply their swift thinking, communication protocol application, and emotional regulation during stress will help institutionalise dynamic and resilient workplace practices into corporate behaviour.

Mapping out clear Standard Operating Procedures (SOPs). Restructuring SOPs act as guidelines, ensuring consistency across the workplace. Re-evaluating and updating as new industry trends emerge, will ensure that organisations undertake best practices and be organisationally resilient through vigilant workplace behaviours.

How might leaders incorporate resilience in reward systems?

Demarcating proper recognition systems within organisations. Acknowledging and rewarding individuals for displaying resilient practices can improve the morale of employees, and also bolster the culture of resiliency in the organisation. Initiatives such as an "Employee Resilience Award" can drive work practices towards organisational goals and set a standard across teams to follow. Team-based rewards can also be used to foster a collaborative environment where resilience is a shared goal for all members.

Measuring performance indicators relating to resilience. Incorporation of resilience-specific metrics to gauge the ability of employees, measuring their productivity and proactivity towards problem solving can allow organisations to evaluate responses to unprecedented difficulties during operations. Staying productive amidst turmoil becomes an integral part of performance assessment and aligns with the resiliency expectations of higher management.

Promoting continuous learning. Emphasising on the significance of continuous learning and adaptation can contribute to organisational resilience. Training workshops can help upskill the competencies of employees as they contribute to a resilient workplace culture and foster the habit of continuous learning as a way of personal development. Grasping opportunities for learning programmes to stay updated with industry norms will allow employees to stay in line with industry practices and develop their resiliency towards unforeseen emergencies.

How might leaders foster innovative work experiences?

Adaptable Work Practices. Work processes have to be more flexible as new trends emerge. Implementing agile methodologies to segregate bigger projects into scheduled, micro-tasks makes assignments more manageable, along with them being continuously evaluated and priorities adjusted accordingly. Empowering teams to create refined work processes allows organisations to stay efficient and effective through newly grasped information based on various scenarios.

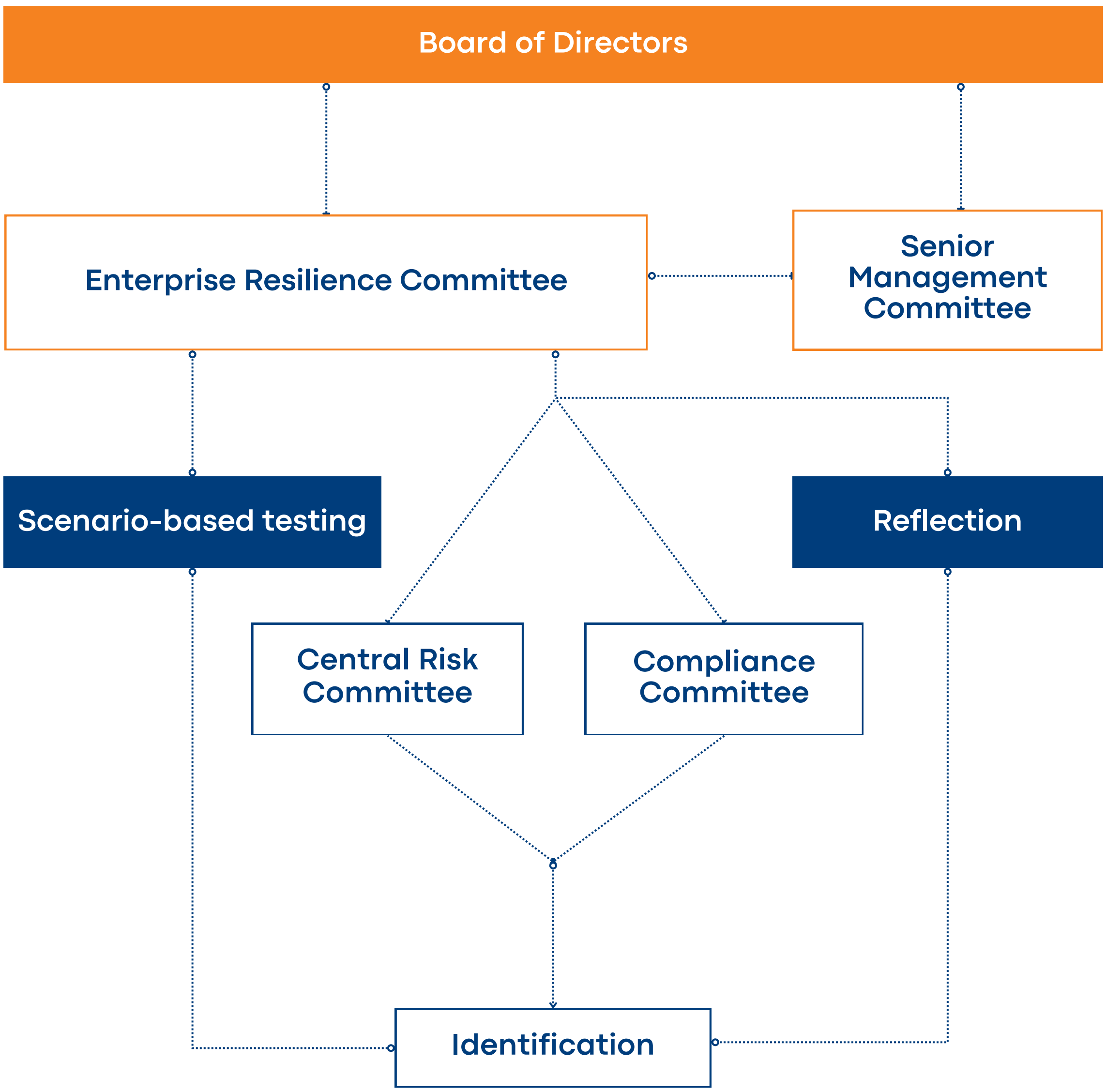
Embracing change. Leaders and key decision-makers are the pillars of support and key personnel in shaping organisational culture. Demonstrating values such as openness in change management, open communication and encouraging behaviours that challenge the status quo, allow organisations to embrace a secure and resilient work culture.

How might leaders build an effective governance structure?

The ideal enterprise resilience governance structure should help the leaders achieve efficient inter-divisional resources management and clear responsibilities delegation. In addition, this governance structure also helps to foster transparency through a positive feedback loop.

An effective structure to establish enterprise resilience has been proposed in the following diagram. The Enterprise Resilience Committee functions independently, which is a common practice. This structure aims to achieve a more clearly defined scope of responsibilities, where the risk committee could focus on identifying core business operations while the enterprise resilience committee would design the response-recovery plan based on the results and feedback from scenario-based tests.

Suggested Organisational Chart



05

Measuring Enterprise Resilience

Measuring enterprise resilience is important for an organisation to determine the level of its vulnerability to face up to expected and unexpected disruptive events, how flexible it is in reorganising itself despite a changing environment, and how effective it may be in recovering. This is given that organisations in different industries will face different types of disruptive events, and the importance of each aspect will vary drastically.

For example, a technological disruption may severely impact a commercial bank and require extremely quick recovery times and high levels of recovery, while a similar disruption may not have such a large impact on a food and beverage company. Furthermore, an organisation that demonstrates high resilience in one aspect may not have the same level of resilience in another, making it essential for organisations to properly assess their resiliency in multiple aspects, such as the aforementioned operational, financial and people resiliency.

The following measurements for operational resilience can also be applied for technological resilience. This is because technological systems are generally deeply embedded in an organisation's daily operations, and thus technological resilience can be assessed through similar measures as operational resilience.

Organisations should incorporate these measurements into their stress testing scenarios to obtain more realistic results in the event of actual adverse situations.

Recovery Time

Recovery time can be defined to be the time taken for an enterprise to overcome disruption and return to its normal state.

To determine recovery time, an organisation needs to establish the start and stop points of the disruption. The start point could either be **(a)** the occurrence of the disruption or **(b)** when the disruption affects the enterprise. In certain cases, this may be the same point in time, but for other incidents, this may extend over a period of time. The stop point depends on the organisation's definition of the recovered state, but this is generally considered to be when the organisation recovers to the original state before the start of the disruption. Recovery time would then be the time between the start and stop points.

Level of Recovery

It is important to clearly define the definitions of resilience with respect to the level of recovery before using it as a measure. Some may deem recovery to the original state to be sufficient for resilience, but others may only require a recovery to a 'minimum state', which is lower than the original level. In contrary, some may require a level of recovery higher than the original. To use the level of recovery as an indicator of resilience, it must be calculated by considering the performance levels of the original, disrupted and recovered states. Depending on an enterprise's needs and objectives, it must decide on a specific recovery level to target and work towards.

These measurements could be translated in organisational practice during "peacetimes", such that baselines and outcomes can be identified when building towards resiliency.

Uptime

Uptime indicates the overall reliability of systems. Having high uptime percentages, especially during disruptive events, suggest that systems are stable and consistently available, which is essential for digital resilience.

In general, organisations should aim for an uptime of **99.9%** (~9 hours of downtime per year) as this ensures a high level of availability with minimal downtime. For organisations in critical industries such as banking or healthcare, an aim of **99.99%** uptime (~1 hour of downtime per year) may be more applicable. This is because downtime may have critical impacts on users, hence the need to maximise uptime even further.

Customer Satisfaction and Retention

Consistently high customer satisfaction scores may indicate that the organisation's digital capabilities meet customer expectations and are sufficiently adaptable under varying conditions. Customer retention simarly signals that the quality of digital services provided continues to be attractive to customers even in the midst of cyber disruptions.

Organisations may use customer satisfaction surveys and regularly survey customers about their experience with the organisation's digital channels. These surveys can be tailored to measure customers' willingness to recommend the organisation's digital services, and how easy it is for customers to interact with digital platforms. Favourable results indicate a higher degree of digital resilience.

In addition, organisations can measure customer retention through the Repeat Purchase Ratio. A higher rate (20-40%) generally signals strong customer retention, which in turn indicates that the organisation has the digital infrastructure, security and customer support to recover quickly from disruptions and meet customer expectations.

$$\frac{\text{NUMBER OF REPEAT CUSTOMERS}}{\text{TOTAL CUSTOMERS}}$$

Measuring Financial Resilience

Organisations can measure financial resilience within the context of enterprise resilience by assessing their ability to withstand and recover from financial disruptions while maintaining long-term stability. This involves evaluating certain financial metrics to determine how well the organisation can meet its short-term obligations and manage financial stress, and should be measured as part of the organisation's stress testing scenarios.

A crucial part of financial resilience is sound cash management, which includes having a sufficient cash buffer and a good current ratio. Having a good debt ratio also ensures an organisation has a manageable level of debt. Measuring and monitoring these metrics will grant organisations a more holistic view of their financial resilience and readiness in facing disruptive events.

→ Cash buffer days

$$\frac{\text{CASH BALANCES}}{\text{CASH OUTFLOWS}}$$

It indicates the number of days of cash outflows a business could pay out of its cash balance if its inflows were to stop. Median cash buffer days vary substantially across different industries, so each organisation should identify an appropriate target buffer based on its needs. Adopting a higher buffer grants organisations a greater margin of error in the face of adverse events or economic headwinds, enhancing financial resilience.

→ Debt Ratio

A low debt ratio indicates that an organisation has a balanced and manageable level of debt relative to its assets. Generally, a figure of 0.5 or lower is ideal, although for organisations in certain industries which are capital-intensive, like real estate or manufacturing, higher debt ratios are still acceptable. A good ratio suggests that the organisation is not overly reliant on borrowing to finance its operations, making it less vulnerable to adverse events and disruptions.

$$\frac{\text{TOTAL LIABILITES}}{\text{TOTAL ASSETS}}$$

Current Ratio

CURRENT ASSETS

CURRENT LIABILITIES

It indicates whether a company can meet its short-term obligations and continue its operations without financial strain. This is key in assessing financial resilience, as it gives the organisation an indication of whether it has sufficient liquidity to cover its debts and operations, and cope with a disruption in its revenue chain caused by adverse events.

A Current Ratio of 1.5 to 2.0 is widely considered to be good, as it indicates the organisation has enough money on-hand to meet its financial obligations without difficulty. This should be measured consistently as part of the stress testing procedures, as it will provide a realistic indication of how well the organisation can cope during adverse events with regards to its financial resilience.

Current Ratio

1.5

to

2.0

Other Metrics

Besides the stated financial metrics and ratios, organisations may also identify others which are most applicable to them based on their characteristics, such as their financial structure, size of organisation and industry. Such metrics may cover cash flows, liquidity, inventory and receivables turnover, debt and equity. A combination of these metrics will be able to provide a more holistic indication of their financial resilience.

Organisations would need to consider industry-specific financial ratios, as well as minimum standards that are legislative or regulatory in nature, in order to ensure business continuity.

Measuring People Resilience

Measuring people resilience in an enterprise is inherently challenging due to the complex and subjective nature of human responses to stress and adversity. Unlike operational or financial resilience, which have indicators, individual resilience is influenced by multiple factors such as employee mental health, workplace environment and external pressures. Moreover, resilience manifests differently across employees; some may be more agile and quicker in adapting to sudden changes, while others might take a more organised and analytical approach to resolving problems brought about by adverse events. This variability makes it difficult to use standardised metrics for assessment.

One of the most effective ways to gauge employee resilience is through self-assessments, where employees can reflect on how much they agreed or disagreed with statements that exemplified resilience-promoting behaviours. Research shows that these statements should cover seven key components:

Living authentically - knowing and adhering to personal values, using strengths, and maintaining emotional awareness.

Finding one's calling - seeking purposeful work that aligns with core values and beliefs.

Maintaining perspective - reframing setbacks, staying solution-focused, and managing negativity.

Managing stress - using routines that manage stress, maintain work-life balance, and allow time for relaxation.

Interacting cooperatively – adopting a work style focused on seeking and giving feedback, advice and support.

Staying healthy - maintaining physical fitness and a healthy diet.

Building networks - developing and maintaining personal support networks.

Organisations should obtain this information immediately after conducting their stress-testing scenarios, which will grant them the most realistic measurements of people resilience in case of actual adverse events. By gathering this direct feedback, organisations can obtain a more accurate, personalised understanding of resilience across their workforce.

Conclusion

Enterprise resilience is not only adapting workplace practices to meet the bare minimum for business survival, but instead about thriving amidst such environmental adversity. This playbook is specifically designed to provide the guidance, a framework that highlights how organisations can embed resilient work practices into their operational activities and stay competitive amidst unforeseen circumstances. These fields range out across operational, financial, technological, digital and even its people, requiring organisations to expand further than their traditional approaches and proactively react to challenges in their respective industries and stay resilient.

Real-time data, forecasting analytics and scenario-based training become essential in preparing organisations to stay agile and adaptable, focusing on the risk management lifecycle to stay operationally ready. Communication with stakeholders and effective collaboration ensures that resilience efforts are a cohesive effort. Defining metrics to measure resiliency processes and integration such as financial health indicators, or recovery time can act as certain tools that would help evaluate and assess the readiness of organisations in the face of disruptions.

To conclude, this playbook imparts the significance of enterprise resilience as a strategic imperative that must be embedded into the very core of organisational processes, allowing organisations to adapt and overcome challenges, even emerging stronger in future-proofed scenarios.

Enterprise Resilience:
A Checklist for Organisations

- [ ] Has your organisation leveraged on technological tools and engage your employees and stakeholders during risk identification?
- [ ] Has your organisation incorporated dynamic factors during risk assessment? Is it strengthened through advanced scenario analysis and stress testing?
- [ ] Are the mitigation strategies adopted flexible and adaptable to changing circumstances? Are they accompanied by agile decision making and clear escalation protocols?
- [ ] Has your organisation enhanced risk monitoring using technology? Are the insights derived used to drive feedback loops to support the other stages of the risk management lifecycle?
- [ ] Has your organisation included methods to measure operational and technological resilience, such as recovery time and recovery level, as part of its stress testing procedures?
- [ ] Has your organisation included methods to measure digital resilience, such as uptime, customer share and retention rates?
- [ ] Has your organisation begun measuring financial resilience by identifying key indicators such as cash buffer days, debt ratio, current ratio and other relevant metrics?
- [ ] Has your organisation developed methods to measure people resilience, such as preparing employee self-assessments to be conducted immediately after stress testing scenarios?
- [ ] Has your organisation defined roles and communication strategies for crisis scenarios to ensure coordinated respones?
- [ ] Has your organisation embedded inclusivity and adaptable work culture processes to promote innovative solutions to unforeseen challenges? Has your organisation devised a clear vision towards building resilience across teams?

0 to 3 checkboxes

You should consider kickstarting some actionable plans to ensure your organisation remains resilient during times of adversity.

Refer to the playbook for possible considerations.

4 to 7 checkboxes

Although some strategies are in place to ensure that your organisation remains resilient, refer to the playbook for differentiated approaches to be comprehensive as possible.

8 to 10 checkboxes

Your organisation has equipped itself with multi-faceted strategies to ensure that it can remain resilient during times of adversity.

References

Allianz Trade. (2021, June). What is a Good Working Capital Ratio?. Allianz Trade.

Aylor, B., Pandey, N., Kay, J., & Schuster, R. (2022). If disruption is the new normal, operational resilience is the new necessity. Boston Consulting Group.

Bennett, N. (2024, April 5). What VUCA Really Means for You. Harvard Business Review.
Boehm, J. (2023, March 24). A technology survival guide for resilience. McKinsey & Company.

Colehower, J. (2023, September 25). Using technology to improve supply-chain resilience. Harvard Business Review.

Comin, D. A., Cruz, M., Cirera, X., Lee, K. M., & Torres, J. (2022, January). Technology and resilience (Working Paper No. 29644). National Bureau of Economic Research.

Cyber Security Agency of Singapore. (2024, July 31). Building digital resilience for organisations.

Davis, K., & Thompson, R. (2019). The role of SOPs in organizational resilience. International Journal of Operations & Production Management, 39(7), 1012-1030.

Deloitte. (2022, March 31). Why prioritizing employees can unlock organizational resilience. Deloitte.

Department of Homeland Security. (2021). DHS resilience framework: Providing a roadmap for the department in operational resilience and readiness.

Edmondson, A. C., & Harvey, J.-F. (2018). Cross-functional teams: A key to organizational resilience. Journal of Organizational Behavior, 39(6), 751-768.

Ernst & Young (2021). Effective Governance of Operational Resilience. Ernest & Young.

Erol, O. (2010, May). Perspectives on Measuring Enterprise Resilience. Systems Conference, 2010 4th Annual IEEE. DOI:10.1109/systems.2010.5482333.

Essuman, D., Boso, N., & Annan, J. (2020). Operational resilience, disruption, and efficiency: Conceptual and empirical analyses. International Journal of Production Economics, 229, 107762.

European Securities and Markets Authority, & European Insurance and Occupational Pensions Authority. (2023, September 29). Joint European Supervisory Authorities' technical advice.

Evenseth, L. L., Sydnes, M., & Gausdal, A. H. (2022). Building organizational resilience through organizational learning: A systematic review. Frontiers in Communication, 7.

Federal Reserve Board. (2020). Sound practices to strengthen operational resilience.

Hall, H. (2023, December 11). How to Evaluate Risk Velocity. Project Risk Coach.

Henderson, L. (2023, June 1). 3 tips for financial resiliency and business survival. Ernest & Young.

Hirsch, J. (2020). Good feedback is a two-way conversation. Harvard Business Review.

Hong Kong Monetary Authority. (2022). Supervisory policy manual: Operational resilience.

ifaa – Institut für angewandte Arbeitswissenschaft e. V., Institut für Arbeitswissenschaft, Technische Universität Darmstadt (IAD), Institut der deutschen Wirtschaft Köln e. V. (IW), & Hochschule Fresenius Düsseldorf. (2018). RESILIENZKOMPASS zur Stärkung der individuellen und organisationalen Resilienz in Unternehmen.

Institute of Chartered Accountants in England and Wales (ICAEW). (2021). A Guide to Operational Resilience. Business and Management Faculty.

International Data Corporation. (2021). IDC's Digital Resiliency Framework for Future Enterprise Success.

J. P. Morgan Chase & Co. (n.d.). Cash is king: Flows, balances, and Buffer Days.

Jain, R., Nauck, F., Poppensieker, T., & White, O. (2020, November 17). Meeting the future: Dynamic risk management for uncertain times.

Jain, Ritesh (2020, November 17). Meeting the future: Dynamic risk management for uncertain times. McKinsey & Company.

Johnson, R. E., & Lee, H. (2022). Inclusivity and organizational resilience: The role of diversity. Human Resource Management Review, 32(2), 100-115.

Johnson, Z. (2022, December 5). How to build resilience for your organization through recognition. HRO Today.

KPMG (2020, May 6). Making sense of risk in an interconnected world. KPMG.

KPMG (n.d.). Improving cash & working capital management. KPMG.

Ladurantie, C. (2024, March 21). Breaking Silos to Ensure Success in Risk Management. MEGA.

Lichte, D., Torres, F. S., & Engler, E. (2022). Framework for operational resilience management of critical infrastructures and organizations. Infrastructures, 7(5), 70.

Maor, D., Park, M., & Weddle, B. (2022). Raising the resilience of your organization. McKinsey & Company.

Monetary Authority of Singapore. (2022). Business continuity management guidelines.

Natale, A., Poppensieker, T., & Thun, M. (2022, March 9). From risk management to strategic resilience. McKinsey & Company.

Office of the Superintendent of Financial Institutions. (2023). Operational resilience and operational risk management - Draft guideline.

Russell, J., & Russell, L. (2006). Measuring employee resilience. Rusell Consulting Inc.

Schatsky, D., Kumar, N. & Bumb, S. (2017, December 12). Bringing the power of AI to the Internet of Things. Deloitte Insights.

Securities and Futures Commission. (2021). Report on operational resilience and remote working arrangements.

Shmul, Y., Reeves, M., & Levin, S. (2022, April 8). Building a mutually reinforcing system of organizational and personal resilience. Boston Consulting Group.

Shore, L. M., Cleveland, J. N., & Sanchez, D. (2018). The role of inclusivity in building organizational resilience. Human Resource Management Review, 28(2), 176-187.

SHRM. (2021). Organizational and employee resilience. SHRM Research Report.

Suarez, F. F., & Montes, J. S. (2020). Building organizational resilience. Harvard Business Review.

ThinkDev. (2020). The power of role modeling: Why leaders and managers must set the example.

Understanding traditional risk management basics—Joh partners. (2024, April 17).

Wert, C. (2023, April 25). The Evolution of Risk Management: From Ancient Civilizations to a Holistic Approach.

Winwood, P., & McEwwn, K. (2013, September). (PDF) a practical measure of workplace resilience.

World Economic Forum. (2022, May 20). Digital resilience: Building the economies of tomorrow on a foundation of cybersecurity.

Yang, C. (2021). How to cultivate organizational resilience before the next crisis. Forbes.

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